Research Article

Coffee's Influence on Social Interaction, Energy and Physical Performance

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Abstract
Coffee consumption is widespread among university students, often is associated with perceived benefits such as improved concentration, higher energy, and enhanced social interaction. However, excessive intake may contribute to health risks including sleep disturbances and anxiety. This study examined coffee consumption patterns and perceptions among students at Universiti Teknologi MARA (UiTM) Dungun, Terengganu. A total of 380 responses were collected through structured questionnaires and analysed using SPSS Version 27. Descriptive analysis revealed that 37.4% of students consumed coffee one to two times daily, with many associating it with improved alertness and motivation. However, regression analysis showed that only physical performance enhancement was significantly related to coffee consumption, whereas social interaction and energy levels were not. These findings underscore the inconsistent nature of caffeine's perceived effects and the need for greater awareness of responsible intake. Future research should consider larger and more diverse samples to strengthen health education strategies.

Keywords:

Coffee consumption, university students, caffeine effects, social interaction, energy levels, physical performance

1 Introduction

Coffee consumption has attracted increasing growing in recent years due to its widespread use and potential effects on health and well-being. Current evidence suggests that moderate intake can provide benefits such as enhanced cognitive performance, mood regulation, and reduced risk of certain health conditions, whereas excessive consumption has been associated with anxiety, sleep disturbances, and dependence (Makki et al., 2023; Lone et al., 2023; Han & Kim, 2025).

Despite these findings, limited research has examined whether the perceived benefits of coffee align with actual outcomes among Malaysian university students. Most existing studies have focused either on general consumption habits or academic performance, leaving a research gap in understanding how coffee influences social interaction, energy levels, and physical performance.

The objective of this study is, therefore, to investigate the frequency of coffee consumption and students' perceptions of its effects on social interaction, energy, and physical performance at Universiti Teknologi MARA (UiTM) Dungun. The findings are expected to contribute practical insights for designing targeted awareness programmes and educational initiatives that promote responsible caffeine consumption, ultimately supporting student health, academic performance, and well-being.

For university students, coffee remains an integral part of academic life. Many rely on caffeine to cope with long study hours, heavy workloads, and stress, perceiving it as a means to improve focus, alertness, and energy levels (Jamal & Abu, 2024; Muhammad Haikal Zulkifly & Zetty, 2023). However, this reliance often occurs without full awareness of potential health risks, such as fatigue crashes, disrupted sleep cycles, and mood fluctuations (Viado, 2024; Herqutanto et al., 2024).

Beyond its physiological effects, coffee also carries cultural and social significance. Campus cafés and study spaces often serve as communal hubs where students connect, collaborate, and socialise, reinforcing coffee's role not only as a stimulant but also as a facilitator of interaction and shared experience (Omar et al., 2023). Nevertheless, recent findings indicate that coffee's perceived benefits such as increased sociability and energy may not always materialise in practice, particularly under academic pressure or poor lifestyle management (Jamal, 2024; Viado, 2024).

In Malaysia, the rising coffee culture among young adults reflects both an increase in consumption patterns and an increasing dependence on caffeine as a cognitive enhancer. While some students report improved concentration and motivation, others experience adverse effects such as stress and irregular sleep. This inconsistency underscores the need to explore actual consumption patterns, motivations, and

perceptions of coffee among university students (Muhammad Haikal Zulkifly & Zetty, 2023).

2 Literature Review

Moderate coffee consumption has been associated with a range of cognitive, physiological, and social benefits, particularly among university students. As a widely consumed stimulant, coffee helps enhance alertness, concentration, and social interactions, making it a central element of student life. However, excessive intake can lead to adverse effects, underscoring the need to understand both the benefits and risks to promote healthy consumption practices.

2.1 Coffee Consumption

Beyond mood enhancement, caffeine contributes to improved cognitive function. Studies indicate that it enhances alertness, attention, and reaction time, while also reducing fatigue. Some research even links caffeine to an increased metabolic rate and fat oxidation, which may aid in weight management. However, excessive consumption defined as more than four cups per day has been associated with side effects such as anxiety, restlessness, and sleep disturbances. Sudden cessation of caffeine intake may also trigger withdrawal symptoms, including headaches, irritability, and mood fluctuations.

Despite these known risks, many university students rely heavily on coffee to cope with academic demands, often without full awareness of the potential health consequences. This pattern raises concerns about their long-term well-being and academic performance. Therefore, there is a pressing need to investigate students' coffee consumption habits, particularly among those at Universiti Teknologi MARA (UiTM) Dungun, Terengganu. Insights from such studies can support the development of targeted programmes that encourage balanced and responsible consumption practices, enabling students to benefit from coffee while minimizing associated risks.

2.2 Perception of Coffee's Effects

Recent studies support the perception that moderate coffee consumption can enhance cognitive function, mood, and social engagement, particularly among university students. Coffee is widely viewed as a tool for sustaining focus, reducing fatigue, and improving academic productivity (Jamal & Abu, 2024; Viado, 2024). It has also been associated with greater alertness, motivation, and concentration, which are especially valued during intense academic stress (Makki et al., 2023; Lone et al., 2023).

In addition to its mental benefits, coffee plays a social role in student life. Campus cafés and communal spaces provide opportunities for interaction and collaboration, reinforcing coffee's identity as both a stimulant and a social facilitator (Omar et al., 2023). Nevertheless, excessive intake can result in adverse outcomes such as anxiety, insomnia, or withdrawal symptoms, which may negatively affect health and academic performance (Herqutanto et al., 2024; Han & Kim, 2025).

Although many students recognize coffee's short-term cognitive advantages, awareness of its long-term health implications remains limited. This knowledge gap highlights the importance of examining student perceptions and designing health education programmes that encourage balanced consumption.

2.3 Hypothesis Development

2.3.1 Social Enhancement (SE)

Coffee consumption is often linked to social interaction, as students perceive it as a means to facilitate conversation and foster collaboration. In Malaysia, coffee culture has become an important aspect of youth socialization, with cafés serving as popular meeting places (Omar et al., 2023). Recent research also suggests that stress relief and social connection are key motivations for coffee drinking among young adults (Meylina et al., 2021). These findings underline the cultural and contextual nature of coffee's social role.

H1: Coffee consumption has a significantly effect social enhancement as perceived by UiTM Dungun students

2.3.2 Energy Enhancement (EE)

One of the most common reasons students consume coffee is to sustain energy and alertness during academic tasks. Caffeine reduces drowsiness and increases focus by blocking adenosine receptors, leading many students to associate it with better concentration and study efficiency (Jamal, 2024; Kharaba et al., 2022).

H2: Coffee consumption has a significantly effect energy enhancement as perceived by UiTM Dungun students

2.3.3 Physical Performance Enhancement (PPE)

Caffeine has also been associated with improvements in physical performance, particularly in endurance activities. Recent studies confirm its effectiveness as an ergogenic aid, helping to reduce perceived exertion and delay fatigue in both athletic and everyday physical activities (Guest et al., 2021; Han & Kim, 2025). However, habitual consumption may lessen its benefits, and overuse can lead to negative outcomes such as jitteriness and reduced performance efficiency (Lone et al., 2023).

H3: Coffee consumption has a significantly effect physical performance enhancement

As summarised in Figure 1 (Conceptual Framework), the study proposes that coffee consumption influences three key domains—social enhancement, energy enhancement, and physical performance enhancement—with the hypotheses (H1, H2, and H3) reflecting these relationships.

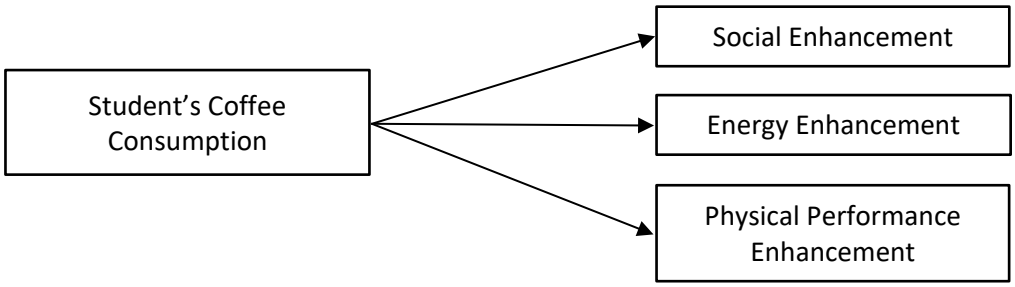

Figure 1: Conceptual framework

3 Methodology

3.1 Population and Sample

To investigate coffee consumption habits and perceptions among university students, it was essential to determine an appropriate sample size and sampling method to ensure accuracy and reliability of findings. The target population consisted of approximately 5,261 students enrolled at Universiti Teknologi MARA (UiTM) Dungun, representing diverse academic programs and backgrounds.

Using the Raosoft sample size calculator with a 5% margin of error and a 95% confidence level, the researchers determined that a sample of 359 students would be statistically sufficient. This ensured that the findings would represent the broader student population and provide meaningful insights into their coffee consumption behaviours.

A convenience sampling method was employed, involving the selection of students who were readily available and willing to participate. While this approach may introduce selection bias and limit generalizability, it is commonly applied in exploratory studies where random sampling is impractical (Jamal, 2024; Lone et al., 2023). Despite its limitations, the method enabled efficient data collection and provided a useful starting point for understanding students' attitudes and practices related to coffee consumption. Future research could employ probability sampling to enhance the representativeness of respondents.

3.2 Research Design

This study adopted a quantitative cross-sectional survey design to examine the relationships between variables. Cross-sectional surveys are appropriate when data are collected at a single point in time to explore associations, identify patterns, and test hypotheses without manipulation of variables (Taherdoost, 2022). The main objective was to investigate how coffee consumption influences students' perceptions of social interaction, energy levels, and physical performance.

In addition to primary data, relevant secondary literature was reviewed to contextualise the findings and strengthen interpretation. This dual approach enriched

the study by combining direct student insights with broader academic perspectives (Viado, 2024).

3.3 Measurement of Instrument

The questionnaire consisted of four sections. Section A gathered demographic data such as gender, age, faculty, semester, preferred coffee consumption time, and frequency of coffee drinking. Section B examined social enhancement through six (6) items measuring coffee's influence on social interactions. Section C assessed its impact on energy levels, while Section D measured coffee's effect on physical performance using three (3) items. Responses in Sections B to D were recorded on a 5-point Likert scale ranging from Strongly Disagree to Strongly Agree to quantify students' perceptions and analyse trends.

3.4 Data Analysis and Statistical Measures

The data was analysed using SPSS Version 27. Descriptive analysis was conducted to summarize frequencies, percentages, means, and standard deviations, helping identify missing values and understand overall data distribution.

For inferential analysis, multiple linear regression was employed to examine the relationships between coffee consumption (independent variable) and three dependent variables (social enhancement, energy enhancement, and physical performance). This approach allowed the researchers to identify significant predictors and interpret the strength and direction of associations. By combining descriptive and inferential statistics, the study provided a comprehensive understanding of patterns and dynamics in coffee consumption behaviour among students.

3.5 Data Collection

Primary data was collected directly from UiTM Dungun students through a structured online questionnaire distributed via WhatsApp and Telegram. This ensured accessibility and encouraged wide participation. The instrument was designed to capture demographic details, coffee consumption patterns, and students' perceptions of its effects, providing relevant data to address the study's objectives and hypotheses.

4 Findings

Data was successfully collected from 380 respondents, offering valuable insights into student demographics and coffee consumption behaviours.

4.1 Demographic Overview

The demographic findings (Table 1) revealed that the majority of respondents were 18 years old (20.8%), predominantly female (59.2%), and mostly held a diploma qualification (40.8%), highlighting strong participation from younger male students with diverse educational backgrounds and suggesting potential influences of age, gender, and education level on coffee consumption attitudes.

Table 1: Respondents' Demographic Variables

Profile	Categories	Frequencies	Percentage (%)
Gender	Male	154	40.5
	Female	225	59.2
Age (years old)	18	79	20.8
	19	55	14.5
	20	44	11.6
	21	51	13.4
	22	62	16.3
	23	37	9.7
	24	37	9.7
	25	15	3.9
Educational Level	Pre-Diploma	59	15.5
	Diploma	155	40.8
	Foundation	71	18.7
	Degree	94	24.7
Frequency of coffee consumption in a week	1-2 times	142	37.4
	3-4 times	92	24.2
	5-6 times	91	23.9
	Daily	55	14.5

4.2 Reliability Analysis

The reliability analysis for Social Enhancement (SE), Energy Enhancement (EE), and Physical Performance Enhancement (PPE) provided important insights into how consistent the measurement scales were in this study. Reliability was measured using Cronbach's Alpha, which showed how well the items in each category worked together to measure the same concept.

Social Enhancement had six (6) questions and achieved a Cronbach's Alpha of 0.961. This high score indicated excellent internal consistency, meaning that the questions were closely related and measured social enhancement effectively. The strong reliability suggested that respondents understood the questions in a similar way, making the results more valid and dependable.

Energy Enhancement, which included eight (8) questions, had an even higher Cronbach's Alpha of 0.962. This showed that the scale was very reliable and even slightly more consistent than Social Enhancement. Since the questions in this section worked well together, they accurately reflected the concept of energy enhancement. The high reliability score meant that any differences in responses were likely due to actual differences in how students experienced the energizing effects of coffee, rather than issues with the questions themselves.

Physical Performance Enhancement had only three (3) questions and recorded a Cronbach's Alpha of 0.941. While this was still a strong score, it was the lowest among the three constructs. The slightly lower reliability might have been because there were fewer questions, or because the items were not as strongly related compared to the other two categories. However, since a score above 0.900 is generally considered very

good for research, this section was still reliable for analysing how coffee affected physical performance.

Overall, the results showed (Table 2) that all three constructs had strong reliability, with Social Enhancement and Energy Enhancement showing particularly high internal consistency. This meant that the measurement tools used in the study were trustworthy and could be used for further research on coffee consumption among students.

Table 2: Reliability Analysis

Question	Number of items	Cronbach's Alpha (α)
Social Enhancement (SE)	6	0.961
Energy Enhancement (EE)	8	0.962
Physical Performance Enhancement (PPE)	3	0.941

4.2.1 Social Enhancement (SE)

The collected data (Table 3) showed the mean and standard deviation for different questions about how coffee consumption affected social interactions. The overall mean score for social enhancement was 3.9195, which indicated that most respondents had a positive view of coffee's impact on their social life. This suggested that many students believed drinking coffee helped them feel more comfortable, interact better with others, or engage more in social activities. The standard deviation values provided insights into how much individual responses varied from the average, showing whether opinions were widely different or mostly similar. These findings highlighted that coffee consumption was generally seen as beneficial for social interactions among the respondents.

Table 3: Descriptive Analysis for Social Enhancement (SE)

Question	Mean	SD
Does coffee make you friendlier?	4.1089	1.04620
Are conversations better with coffee?	4.0196	1.10621
Did you feel more sociable after having coffee?	3.7263	1.32544
Did you feel more confident after having coffee?	3.9469	1.15953
Did coffee make you happy?	3.9302	1.32552
Did coffee improve your mood?	3.7849	1.59519

Note: (SD)Standard Deviation

4.2.2 Energy Enhancement

The collected data (Table 4) showed the mean and standard deviation for different questions about how coffee consumption affected energy levels. The overall mean score for energy enhancement was 3.8823, which indicated that most respondents had a positive view of coffee's ability to boost their energy. This result suggested that many students believed drinking coffee helped them stay awake, feel more active, and maintain focus during their daily activities. The standard deviation values showed how much individual responses varied from the average, helping to understand whether opinions were similar or different among respondents. These findings confirmed that coffee was generally seen as an effective way to increase energy and reduce tiredness.

Table 4: Descriptive Analysis for Energy Enhancement (EE)

Question	Mean	SD
Did coffee make you feel more alert?	3.8184	1.21521
Did you pick up coffee when feeling tired?	3.8380	1.26203
Did coffee make you feel more energetic	4.2179	1.03307
Did you feel less sleepy after having coffee?	3.8240	1.36781
Did coffee help to work over a long period of time?	3.6955	1.60340
Did coffee increase motivation to work?	4.0140	1.14853
Did coffee improve concentration?	4.0000	1.14005
Did coffee improve attention?	3.6508	1.58543

Note: (SD)Standard Deviation

4.2.3 Physical Performance Enhancement

The collected data (Table 5) provided the mean and standard deviation for different questions about how coffee consumption affect physical performance. The overall mean score for physical performance enhancement (PPE) was 3.7356, showing that respondents had a moderately positive opinion about coffee's impact on their physical activities. This suggested that many students believed drinking coffee helped them feel more active, improved their endurance, and reduced tiredness during physical tasks. However, since the score was not very high, it indicated that while some students found coffee beneficial for physical performance, others may not have experienced significant effects. The standard deviation values helped show how much individual responses varied, giving a better understanding of different perceptions among students. These findings highlighted that coffee was generally seen as somewhat helpful for physical activity, but its effects might differ between people.

Table 5: Descriptive Analysis for Physical Performance Enhancement (PPE)

Question	Mean	SD
Did workouts get better after having coffee?	3.6955	1.24551
Did exercise longer if had coffee?	3.6872	1.39322
Did coffee improve athletic performance?	3.8240	1.26127

Note: (SD)Standard Deviation

4.2.4 Overall

The collected data (Table 6) showed the mean and standard deviation for the overall perception of coffee consumption among respondents. The mean score of 4.6508 indicated a strong positive opinion about the benefits of drinking coffee. This suggested that most participants believed coffee had a good impact on their well-being and daily performance. Many students may have felt that coffee helps them stay alert, energized, and focused, making it an important part of their routine. The high mean score showed that coffee was widely appreciated for its positive effects. However, the standard deviation values provided further insight into how much individual opinions varied, helping researchers understand different views on coffee's benefits. These findings confirmed that students generally saw coffee as beneficial in their daily lives.

Table 6: Descriptive Analysis for Coffee Consumption and Perception of its Effects

Question	Mean	SD
Perception of effects of coffee consumption	4.6508	1.90190

Note: (SD)Standard Deviation

4.2.5 Regression Analysis

This study employed regression analysis to examine the impact of the hypotheses on the investigated variables. The results of the regression analysis are shown in Table 7. According to Table 7, only physical performance enhancement demonstrated a positive effect on coffee consumption and the students' perceptions of its effects among UiTM Dungun students.

Table 7: Regression Analysis Result

Hypothesis	t-value	p-value	Remark
H1: Coffee consumption significantly effect social enhancement	0.229	0.819	Rejected
H2: Coffee consumption significantly effect energy enhancement	1.132	0.258	Rejected
H3: Coffee consumption significantly effect physical performance enhancement	-4.411	<0.001	Accepted

4.2.6 Social enhancement

Hypothesis 1 posited that coffee consumption significantly influences social enhancement. However, the statistical results ($t = 0.229$, $p = 0.819$) indicated no significant relationship between coffee intake and improved social interactions. Although coffee is popularly perceived as a social catalyst, the findings suggest that students in this study did not experience notable changes in sociability, confidence, or interpersonal engagement due to coffee consumption.

Several factors may account for this outcome. First, individual differences in caffeine sensitivity could explain the variability in social responses. While some individuals experience greater comfort and engagement, others may feel anxious or restless, which can hinder social functioning (Makki et al., 2023; Lone et al., 2023). Moreover, recent studies highlight that excessive caffeine consumption is associated with heightened stress and anxiety, which may reduce willingness to engage socially (Jamal, 2024).

Another factor is tolerance developed through habitual consumption. Students who consume coffee regularly may experience diminished stimulating effects over time, leading to weaker associations between caffeine intake and social enhancement (Han & Kim, 2025). This could explain why frequent consumers in this study did not report significant social benefits.

Context also plays a crucial role. Many students consume coffee in solitary settings such as late-night study sessions rather than in social environments. Research indicates that the mood-enhancing effects of coffee are more evident in communal contexts like cafés or group settings (Omar et al., 2023; Viado, 2024). Thus, the way coffee is typically

consumed at UiTM Dungun mainly as a functional aid for academic productivity likely limits its influence on social engagement.

Cultural perceptions may further shape these findings. In Malaysia, coffee is often viewed as a functional beverage associated with work or study rather than socialization, in contrast to Western cultures where coffee drinking is embedded in social routines (Makki et al., 2023). Academic stress may also overshadow caffeine's potential social benefits, further muting any positive effects. In summary, despite its reputation as a social enhancer, coffee did not significantly influence students' social behaviour in this study. This may be due to variations in caffeine sensitivity, habitual consumption, solitary usage contexts, and cultural attitudes. Future research should explore these variables in greater depth to better understand caffeine's social implications among student populations.

4.2.7 Energy enhancement

Hypothesis 2 proposed that coffee significantly enhances perceived energy levels. However, the results ($t = 1.132$, $p = 0.258$) did not support this assumption. Despite the common belief that coffee boosts energy, students in this study did not report substantial improvements in alertness or stamina after consumption.

Several factors may explain this outcome. One possible explanation lies in the timing and context of consumption. Many students consume coffee when already experiencing fatigued such as after late-night study sessions or during early classes when caffeine's effects may be less noticeable (Viado, 2024). Similarly, students who drink coffee habitually may develop tolerance, requiring higher doses to achieve the same energizing effects (Han & Kim, 2025).

Another consideration is individual variability in caffeine metabolism. Research suggests that differences in physiological response influence how strongly students perceive caffeine's effects, with some reporting strong stimulation while others notice minimal changes (Lone et al., 2023). In addition, expectations and cultural perceptions of coffee play a role; if students view coffee as a routine beverage rather than an energy enhancer, they may be less likely to attribute perceived alertness to caffeine (Jamal, 2024). In summary, the findings indicate that while students commonly associate coffee with wakefulness, its actual effect on perceived energy may be inconsistent due to timing, tolerance, and individual differences.

4.2.8 Physical performance enhancement

Unlike the previous hypotheses, Hypothesis 3 which asserted a significant relationship between coffee consumption and physical performance was supported ($t = -4.411$, $p < 0.001$). The negative t-value suggests that students reported lower perceived exertion during physical activity, consistent with caffeine's role as an ergogenic aid.

Recent studies confirm that caffeine improves endurance, focus, and reaction time by stimulating the central nervous system and enhancing adrenaline release (Guest et al., 2021; Han & Kim, 2025). These effects help delay fatigue, improve motor control,

and boost overall physical capacity, which explains why students in this study perceived better physical performance after consuming coffee.

However, not all students may benefit equally. Variability in caffeine sensitivity means some individuals experience enhanced stamina, while others report adverse effects such as jitteriness or increased heart rate (Makki et al., 2023). Additionally, long-term habitual intake can reduce caffeine's effectiveness, making it less beneficial for performance over time (Lone et al., 2023). Overall, the results align with existing evidence that caffeine is an effective performance enhancer, particularly for physical endurance. Nevertheless, responsible consumption is crucial to maximize benefits while minimizing potential side effects.

5 Conclusion

This study provides important insights into the perceived effects of coffee consumption on social interaction, energy levels, and physical performance among students at UiTM Dungun. The findings revealed that coffee did not significantly influence social engagement or perceived energy levels, contradicting common assumptions. In contrast, coffee consumption was found to significantly enhance physical performance, supporting evidence that caffeine functions as an effective ergogenic aid (Guest et al., 2021; Han & Kim, 2025).

These results suggest that the benefits of caffeine are not uniform across all domains. Factors such as individual sensitivity, habitual intake, cultural attitudes, and the context of consumption shape how students perceive coffee's effects (Makki et al., 2023; Lone et al., 2023). While it may provide meaningful improvements in endurance and focus, its role in boosting sociability and energy appears less consistent (Jamal, 2024; Viado, 2024).

For students, practical steps include:

- Limiting daily intake to within recommended guidelines (no more than 400 mg of caffeine, equivalent to roughly 3–4 cups of coffee) (EFSA, 2015).
- Avoiding caffeine in the late afternoon or evening to reduce sleep disturbances (Herqutanto et al., 2024).
- Choosing healthier alternatives such as herbal teas, water, or fresh juices when coffee is not necessary (Makki et al., 2023).
- Using coffee strategically for academic or physical performance demands, rather than as a habitual coping mechanism (Lone et al., 2023).

For universities, actionable strategies include:

- Developing health campaigns that raise awareness about safe caffeine use and its risks (Jamal, 2024).
- Incorporating caffeine education into student wellness or orientation programmes (Viado, 2024).
- Providing a wider variety of beverage options on campus, including decaffeinated coffee and low-sugar drinks (Omar et al., 2023).

- Establishing stress-management initiatives and rest spaces, reducing students' reliance on stimulants for coping (Makki et al., 2023).

Limitations of this study include reliance on self-reported data and a cross-sectional design, which restricts causal interpretations. Future research should consider longitudinal approaches, physiological measures (e.g., heart rate, cortisol), and diverse student populations to strengthen generalisability. Moreover, examining dose-response effects and lifestyle moderators such as sleep quality, stress, and gender differences could further clarify caffeine's varied impacts.

In summary, while coffee remains an integral part of student life, its perceived benefits are more pronounced in physical performance than in social or energy domains. Promoting balanced and responsible caffeine consumption through student self-regulation and institutional support is essential to safeguard student well-being and academic success.

6 About the authors

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