



The Relationship Between Coffee Consumption and Students' Stress Levels

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ABSTRACT

Final-year students often face high academic pressure, particularly during the completion of their thesis or final project. This condition has the potential to cause stress, which may negatively affect physical and mental health if not properly managed. Coffee consumption is a common habit among students to support their academic activities. The caffeine content in coffee is known to stimulate the central nervous system, thereby increasing alertness and reducing fatigue. However, studies specifically examining the relationship between the frequency of coffee consumption and stress levels among students remain limited. This study aims to analyze the relationship between the frequency of coffee consumption and stress levels among final-year students. This research employed a quantitative approach with a cross-sectional design. The sample consisted of 52 respondents selected using a total sampling technique based on inclusion criteria. Data were collected using a Food Frequency Questionnaire (FFQ) to assess coffee consumption and the Depression Anxiety Stress Scale (DASS-21) to measure stress levels. Data analysis was performed using the Spearman test. The results showed that most respondents consumed coffee more than three times per day and were categorized as having moderate stress levels. Statistical analysis indicated a significant negative correlation between the frequency of coffee consumption and stress levels ($\rho = -0.389$; $p = 0.004$), meaning that the higher the frequency of coffee consumption, the lower the perceived stress level. In conclusion, there is a moderate negative relationship between the frequency of coffee consumption and stress levels among final-year students at STIKes RS Husada.

Keywords: Final Year Students, Frequency of Coffee Consumption, Stress Level.

ABSTRAK

Mahasiswa tingkat akhir sering menghadapi tekanan akademik yang tinggi, terutama dalam proses penyelesaian tugas akhir atau skripsi. Kondisi tersebut berpotensi menimbulkan stres yang dapat berdampak pada kesehatan fisik dan mental apabila tidak dikelola dengan baik. Konsumsi kopi merupakan salah satu kebiasaan yang umum dilakukan mahasiswa untuk menunjang aktivitas akademik. Kandungan kafein dalam kopi diketahui dapat menstimulasi sistem saraf pusat, sehingga meningkatkan kewaspadaan dan mengurangi kelelahan. Namun, penelitian yang secara khusus mengkaji hubungan antara frekuensi konsumsi kopi dan tingkat stres pada mahasiswa masih terbatas. Penelitian ini bertujuan untuk menganalisis hubungan antara frekuensi konsumsi kopi dengan tingkat stres pada mahasiswa tingkat akhir. Penelitian ini menggunakan pendekatan kuantitatif dengan desain cross-sectional. Sampel penelitian berjumlah 52 responden yang dipilih menggunakan teknik total sampling sesuai kriteria inklusi. Pengumpulan data dilakukan menggunakan kuesioner Food Frequency Questionnaire (FFQ) untuk mengukur konsumsi kopi dan skala Depression Anxiety Stress Scale (DASS-21) untuk mengukur tingkat stres. Analisis data menggunakan uji Spearman. Hasil penelitian menunjukkan bahwa sebagian besar responden mengonsumsi kopi lebih dari tiga kali per hari dan berada pada kategori stres sedang. Uji statistik menunjukkan adanya hubungan negatif yang signifikan antara frekuensi konsumsi kopi dan tingkat stres ($\rho = -0,389$; $p = 0,004$), yang berarti semakin tinggi frekuensi konsumsi kopi, semakin rendah tingkat stres yang dirasakan. Penelitian ini menyimpulkan bahwa terdapat hubungan negatif dengan kekuatan sedang antara frekuensi konsumsi kopi dan tingkat stres pada mahasiswa tingkat akhir di STIKes RS Husada.

Kata Kunci: Mahasiswa Tingkat Akhir, Frekuensi Konsumsi Kopi, Tingkat Stres.

INTRODUCTION

Final-year students often face significant academic pressure, particularly during the process of completing their final thesis or undergraduate research project. These challenges frequently

trigger stress that affects both students' psychological conditions and academic performance. Academic stress may arise from various factors, such as environmental pressure, parental expectations, difficulties in selecting a research topic, and obstacles during the supervision process (Hariaty et al. 2023; Putri et al. 2025).

Stress is defined as an individual's physiological and psychological response to demands that exceed their adaptive capacity (Safira 2024). In the context of higher education, nursing students are particularly vulnerable to academic stress because they must simultaneously master both theoretical coursework and clinical practice (Rosyidah et al. 2020). If not properly managed, this condition may develop into psychological disorders such as anxiety, depression, and even burnout (Mario et al. 2024; Sahertian et al. 2024). Globally, the prevalence of mental disorders is considerably high, with more than one billion people affected (WHO 2022). In Indonesia, data indicate that approximately 9.8% of the population aged over 15 years experiences emotional mental disorders (Badan Penelitian dan Pengembangan Kesehatan, 2019).

In coping with stress, students generally adopt various coping strategies, one of which is coffee consumption. The caffeine content in coffee is known to stimulate the central nervous system, thereby increasing alertness and reducing fatigue (Dewanti & Tadjudin, 2023; Pradnyatana et al., 2022). However, excessive coffee consumption may also lead to negative effects, such as sleep disturbances and gastrointestinal problems (Liu et al., 2024; Min et al., 2023). This indicates that coffee consumption has a dual role, serving both as a potential coping mechanism and as a health risk factor.

Although coffee consumption is a common habit among students, scientific studies specifically examining the relationship between coffee consumption frequency and stress levels remain limited, particularly among final-year students. Most previous studies have focused on the effects of caffeine on alertness, sleep quality, or cognitive performance, while the psychological stress aspect has not been extensively explored. In addition, previous findings are inconsistent, resulting in no strong conclusion regarding the role of coffee consumption as a coping mechanism for academic stress.

Based on this, there is a research gap in the limited empirical evidence examining the relationship between coffee consumption frequency and stress levels, especially among final-year nursing students who experience more complex academic and clinical workload demands. The novelty of this study lies in its focus on analyzing the relationship between coffee consumption frequency as a form of coping behavior and academic stress in a specific population, namely final-year undergraduate nursing students, which has rarely been contextually studied. Therefore, this study aims to analyze the relationship between coffee consumption frequency and stress levels among final-year undergraduate nursing students at STIKes RS Husada.

RESEARCH METHODS

This study employed a quantitative approach with a cross-sectional design to analyze the relationship between coffee consumption frequency and stress levels among final-year undergraduate nursing students at STIKes RS Husada. The study was conducted at STIKes RS Husada, Jakarta, from January to July 2025.

The study population consisted of all final-year undergraduate nursing students at STIKes RS Husada, totaling 71 students. A total sampling technique was used; therefore, all members of the population who met the inclusion and exclusion criteria were invited to participate in the study. From the total population, 52 respondents met the criteria and agreed to participate.

Data were collected using a structured questionnaire distributed online via Google Forms. The research instrument consisted of three sections: (1) a demographic questionnaire, including age, gender, type of coffee consumed, sleep quality, and monthly allowance; (2) a coffee consumption frequency questionnaire using the Food Frequency Questionnaire (FFQ), adapted from Setiastuti (2023). The adaptation process involved linguistic and contextual adjustments to suit the characteristics of student respondents. The validity test showed correlation coefficients (r values) ranging from 0.906 to 0.974, while the reliability test yielded a Cronbach's alpha of 0.793. Coffee consumption frequency was categorized based on FFQ scores into three levels: low (normal), moderate, and high consumption. These categories were determined based on daily coffee consumption frequency rather than caffeine intake in milligrams; and (3) a stress level

questionnaire using the Depression Anxiety Stress Scale (DASS-21), adapted from Sutanti, Handoko, & Nabilah (2022), to assess respondents' stress levels. The instrument demonstrated excellent internal consistency with a Cronbach's alpha value of 0.918.

After data collection, the data were processed through editing, coding, entry, and cleaning to ensure completeness and accuracy before analysis. Data analysis was performed in two stages: univariate analysis to describe the distribution of each study variable, and bivariate analysis to examine the relationship between coffee consumption frequency and stress levels using the Spearman Rank correlation test. This test was chosen because the variables were measured on an ordinal scale and the data did not assume a normal distribution, making it appropriate for non-parametric analysis.

Ethical approval for this study was obtained from the Health Research Ethics Committee of Universitas Muhammadiyah Surakarta with reference number 1175/KEPK-FIK/V/2025. All respondents were informed about the study objectives and procedures and provided voluntary informed consent prior to completing the questionnaire.

RESULTS

Table 1. Characteristics of Respondents (n = 52).

Variable	Category	Frequency (n)	Percentage (%)
Age	22 years	24	46.2
Gender	Female	48	92.3
	Male	4	7.7
Type of Coffee Consumed	Espresso-based (coffee with milk/sugar/cream)	23	44.2
Daily Sleep Duration	±6 hours	34	65.4
Monthly Allowance	IDR 1,000,000	30	57.7

Table 1 presents the characteristics of the respondents. The majority of participants were 22 years old (46.2%). Most respondents were female (92.3%), while only a small proportion were male (7.7%). Regarding coffee consumption, the most commonly consumed type was espresso-based coffee (44.2%). In terms of sleep patterns, most respondents reported sleeping approximately 6 hours per day (65.4%). In addition, the majority of respondents received a monthly allowance of IDR 1,000,000 (57.7%). Overall, these characteristics provide a general overview of the respondents that serves as a basis for further analysis of the relationship between coffee consumption and stress levels.

Table 2. Distribution of Coffee Consumption Frequency and Stress Levels Among Final Year Students (n = 52).

Category	Frequency (n)	Percentage (%)
Coffee Consumption Frequency		
Normal	3	5.8
Moderate	23	44.2
High	26	50.0
Total	52	100.0
Stress Levels		
Mild	16	30.8
Moderate	32	61.5
Severe	4	7.7
Total	52	100.0

Table 2 shows that most respondents had a high frequency of coffee consumption (50.0%), followed by moderate consumption (44.2%), and only a small proportion had normal consumption (5.8%). Regarding stress levels, most respondents were classified as having moderate stress (61.5%), followed by mild stress (30.8%), and severe stress (7.7%). These findings indicate that high coffee consumption is commonly observed alongside moderate stress levels among respondents, suggesting the need for further analysis of the relationship between these variables.

Table 3. Relationship Between Coffee Consumption Frequency and Stress Levels Among Final-Year Students.

Variable	Coffee Consumption Frequency	Stress Level
Spearman's rho	Correlation Coefficient	1.000
	Sig. (2-tailed)	-0.389
	N	0.004
	52	52
	Correlation Coefficient	-0.389
	Sig. (2-tailed)	1.000
	N	0.004
	52	52

Table 3 shows that the Spearman correlation test results indicate a statistically significant relationship between coffee consumption frequency and stress levels ($p = 0.004$; $p < 0.05$). The correlation coefficient of -0.389 indicates a moderate negative relationship between the two variables. This suggests that higher coffee consumption frequency is associated with lower stress levels among respondents. Therefore, there is a significant inverse relationship between coffee consumption frequency and stress levels in this study.

DISCUSSION

The results of this study indicate a moderate negative correlation between coffee consumption frequency and stress levels among final-year nursing students. This finding suggests that students who consume coffee more frequently tend to report lower levels of stress. However, this relationship does not imply causality and should be interpreted within a psychophysiological and academic context. Biologically, caffeine acts as an adenosine receptor antagonist, which enhances alertness, attention, and perceived energy levels. In students facing high academic demands such as thesis completion and clinical practice, this increased alertness may temporarily reduce perceived fatigue and psychological burden, which is reflected in lower stress scores. In addition, coffee consumption in certain academic and social contexts may also function as a psychological coping strategy, as it is commonly integrated into students' study routines.

However, these findings differ from the study by Makki et al. (2023), which reported no significant relationship between caffeine consumption and stress levels among students. This discrepancy may be explained by several factors. First, differences in cultural and academic contexts may influence coping behaviors, nursing students in Indonesia generally experience heavier academic and clinical workloads, leading to more frequent use of coffee as a stamina-supporting substance. Second, the type of coffee consumed in this study was predominantly espresso-based coffee with added milk and sugar, which may provide additional sensory comfort and psychological relaxation compared to plain black coffee or other caffeine sources. Third, potential confounding variables such as sleep quality, academic workload, and other coping strategies were not controlled in the analysis, which may have influenced the observed relationship.

It is important to note that coffee consumption is not always adaptive. Previous studies have shown that excessive caffeine intake may increase sympathetic nervous system activity and cortisol levels, potentially worsening stress and sleep disturbances. Therefore, the negative

correlation observed in this study may reflect the effects of moderate or context-specific consumption rather than a universal stress-reducing mechanism.

Regarding respondent characteristics, most participants were 22 years old, followed by 21 and 23 years old. Coffee consumption has become an integral part of students' daily routines, particularly during thesis writing periods, as it is often used to enhance energy and reduce drowsiness (Arpiani, Widhawati, & Purwanti, 2023; Dewanti & Tadjudin, 2023). The majority of respondents were female (92.3%), which is consistent with findings suggesting that female students tend to report higher stress sensitivity due to emotional responsiveness (Usraleli et al. 2020) and may also have different caffeine consumption patterns compared to males (Kharaba et al. 2022).

Most respondents reported approximately six hours of sleep per night. Coffee is commonly used to maintain focus and alertness, especially during sleep deprivation or late-night study sessions (Ginting et al., 2022). However, students with less than six hours of sleep tend to experience higher stress levels (Idrus et al. 2023). Academic stress itself is often triggered by workload pressure and fear of failure (Hamzah & Rahmawati, 2020). Since caffeine peaks within 30–60 minutes and has a half-life of 3–10 hours, inappropriate timing of coffee consumption may also interfere with sleep quality (Arpiani, Widhawati, & Purwanti, 2023).

In terms of coffee type, most respondents preferred espresso-based coffee (44.2%), followed by packaged coffee (38.5%) and instant coffee (17.3%). The popularity of packaged and ready-to-drink coffee is associated with its practicality and accessibility (Zalda & Alamsyah, 2024). While caffeine helps maintain alertness, sweetened and milk-based coffee may negatively affect sleep quality (Hastuti et al., 2025). Moreover, coffee consumption among students is also influenced by social media trends, where coffee is often portrayed as part of modern youth lifestyle and social identity (Pramelani, 2020).

Regarding monthly allowance, most respondents received IDR 1,000,000 per month (57.7%). Financial limitations may influence purchasing behavior, including coffee consumption during thesis preparation (Hastuti et al. 2025). Economic constraints can also contribute to stress due to difficulties in meeting academic and personal needs, such as printing costs and daily expenses (Usraleli et al., 2020).

Based on coffee consumption frequency, 50% of respondents were classified as high consumers, 44.2% moderate, and 5.8% normal according to the FFQ results. Students reportedly consumed an average of 260 ml of coffee per day (approximately one cup), primarily to reduce sleepiness and maintain concentration (Putri, 2022). However, excessive consumption may have adverse effects, including increased anxiety symptoms and emotional instability (Min et al., 2023). In some cases, coffee consumption may also be categorized as maladaptive coping when it contributes to sleep disruption and anxiety (Higbee, Gipson, & El-saidi, 2022).

Most respondents experienced moderate stress levels (61.5%), followed by mild (30.8%) and severe stress (7.7%). Final-year students are particularly vulnerable to stress due to academic pressure (Palamba et al. 2024). Stress in this group is often associated with low confidence in completing academic tasks, which may lead to procrastination (Oktaviona et al. 2023). Stress can also affect physical, emotional, and social functioning, including sleep disturbances, irritability, and social withdrawal (Sahertian et al. 2024).

Before conducting correlation analysis, the Kolmogorov-Smirnov normality test indicated that both variables were not normally distributed ($p < 0.05$), so the Spearman rank correlation test was applied. The results showed a significant relationship between coffee consumption frequency and stress levels. This indicates that higher coffee consumption is associated with lower stress levels. Caffeine consumption may serve as a coping strategy for managing academic pressure by increasing energy, attention, and perceived ability to cope with academic demands (Dermawan et al. 2024).

However, previous studies present mixed findings. Pradnyatana et al. (2022) stated that although coffee may function as an adaptive coping mechanism, excessive consumption can increase cortisol levels and sympathetic nervous system activation, ultimately worsening stress. Liunima et al. (2017) also support a significant relationship between coffee consumption and stress. In contrast, Makki et al. (2023) found no significant association, possibly due to differences in academic workload and social context. Nursing students in Indonesia generally

experience higher academic and clinical demands, making coffee a more common coping tool for maintaining focus and stamina. Additionally, the predominance of espresso-based coffee with milk and sugar in this study may produce different psychological effects compared to black coffee or other caffeine sources.

Although a significant association was found, this study has several limitations. The cross-sectional design limits the ability to infer causal relationships between coffee consumption and stress levels. The use of self-reported questionnaires may introduce recall and response bias. The relatively small sample size and inclusion of participants from a single institution limit the generalizability of the findings. Furthermore, important confounding factors such as physical activity, time management, sleep quality, and social support were not controlled in this study. Future research is recommended to use longitudinal designs or multivariate analyses to control confounding variables and to apply quantitative measures of caffeine intake to provide a more comprehensive understanding of the relationship between coffee consumption and stress among students.

CONCLUSION

This study found a moderate negative relationship between coffee consumption frequency and stress levels among final-year undergraduate nursing students at STIKes RS Husada. This indicates that coffee consumption frequency is associated with students' reported stress levels; however, it does not imply a causal relationship between the two variables. The observed association should be interpreted within the limitations of the cross-sectional design, which does not account for other contributing factors to stress, such as academic workload, sleep quality, coping strategies, and social support. Therefore, coffee consumption cannot be interpreted as a method for reducing stress, but rather as a behavior that is associated with stress conditions among final-year students. These findings provide empirical evidence for future research to further investigate the relationship between coffee consumption and stress using more comprehensive methodological approaches and better control of confounding variables.

Based on these results, students are advised not to rely on coffee as the primary coping strategy for stress and are encouraged to adopt healthier habits such as effective time management, adequate sleep, and regular physical activity. Educational institutions are expected to provide counseling services and mental health education to support student well-being. Future research is recommended to explore additional factors influencing stress, such as sleep patterns, other sources of caffeine intake (e.g., tea and chocolate), and social support, in order to obtain a more comprehensive understanding of student stress dynamics.

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