



Department of Digital Business

Journal of Artificial Intelligence and Digital Business (RIGGS)

Homepage: <https://journal.ilmudata.co.id/index.php/RIGGS>

Vol. 4 No. 2 (2025) pp: 2177-2185

P-ISSN: 2963-9298, e-ISSN: 2963-914X

Time Pressure's Impact on Jam Koma and Academic Stress in Undergraduate Students

Rohana Nur Aini¹, Muhammad Ramadhani Kesuma², Lusiana Desy Ariswati³, Margareth Henrika S.⁴, Chandika Mahendra Widaryo⁵, Ellen D. Oktanti Irianto⁶

^{1,2,3,4,5,6}Management Study Program, Faculty of Economics and Business, Mulawarman University

¹rohana@feb.unmul.ac.id, ²ramadhani@feb.unmul.ac.id*, ³lusiana@feb.unmul.ac.id, ⁴margareth@feb.unmul.ac.id,

⁵chandika@feb.unmul.ac.id, ⁶ellend@feb.unmul.ac.id

Abstract

This research explores the effects of time pressure on cognitive fatigue, known locally as jam koma, and academic stress among undergraduate students in Samarinda, Indonesia, incorporating age and gender as control variables. Utilizing a cross-sectional survey approach, data were gathered from 150 undergraduate students through validated instruments assessing perceived time pressure, cognitive fatigue, and academic stress levels. Linear regression analyses demonstrated that time pressure exerts a significant influence on both cognitive fatigue and academic stress, whereas age and gender showed negligible impacts. These results highlight the critical role of time pressure in undermining student well-being, emphasizing the need for institutional measures such as time management workshops and mental health support programs. The culturally distinctive jam koma phenomenon offers fresh perspectives on cognitive exhaustion within Indonesia's academic landscape, enriching global discussions on student mental health. By addressing these findings, universities can foster more supportive academic frameworks, mitigating the adverse effects of time pressure. This study bridges local and international scholarship, advocating for culturally informed interventions to enhance student resilience and productivity.

Keywords: Time Pressure, Cognitive Fatigue, Jam Koma, Academic Stress, Undergraduate Students

1. Introduction

In the evolving landscape of higher education, undergraduate students face multifaceted challenges that strain their cognitive and emotional capacities. Among these, time pressure emerges as a formidable stressor, compelling students to manage tight deadlines, demanding academic workloads, and societal expectations within constrained temporal boundaries. In Samarinda, a dynamic educational center in East Kalimantan, Indonesia, undergraduate students navigate these pressures within a culturally rich yet rigorous academic environment shaped by collectivist values. This study examines the impact of time pressure on cognitive fatigue, locally termed jam koma, and academic stress among undergraduate students in Samarinda, with age and gender as control variables. By exploring these dynamics, the research aims to provide insights into fostering student well-being and academic success, addressing a pressing issue in Indonesia's higher education system.

Time pressure, characterized by the perception of insufficient time to complete tasks, is a well-established stressor in academic contexts. It disrupts cognitive processes, leading to diminished performance and heightened psychological distress (Nweke et al., 2024). The Job Demands-Resources (JDR) model serves as the theoretical backbone of this study, positing that high demands, such as time pressure, deplete cognitive and emotional resources, resulting in fatigue and stress (Hlad'o & Harvánková, 2024). When resources like social support or effective time management are lacking, these demands can escalate into burnout, undermining students' academic efficacy (Jonge & Huter, 2021). In Indonesia, where academic achievement is closely tied to familial and social prestige, time pressure intensifies these demands, placing undergraduate students under considerable strain (Hidayat & Hasim, 2023).

Cognitive fatigue, manifested as jam koma in Indonesia, represents a culturally nuanced form of mental exhaustion. Unlike general fatigue, jam koma denotes a state of cognitive depletion marked by reduced attention, impaired decision-making, and a sense of mental paralysis, often observed after prolonged academic exertion, such as during examination periods (Lorohoema Soumilena et al., 2023; Nieuwoudt, 2023; Qiang et al., 2024). Laato et al. (2020) note that cognitive fatigue impairs executive functions, aligning with the symptoms of jam koma

reported by students in Samarinda. This phenomenon is particularly salient in collectivist cultures, where societal expectations and group conformity amplify academic pressure (Alsaif et al., 2024). Despite its prevalence, jam koma remains underexplored in academic literature, particularly as a cultural indicator of cognitive overload, making this study a significant contribution to the field.

Academic stress, defined by anxiety, overwhelm, and perceived inability to cope with academic demands, is another critical outcome of time pressure. Chronic stress erodes student motivation, mental health, and long-term academic performance (Nweke et al., 2024). In Samarinda, Indonesia's collectivist cultural framework exacerbates this stress, as students face external pressures from family and community to achieve academic excellence (Hidayat & Hasim, 2023). These pressures are intensified by cultural values emphasizing family honor and societal contributions, which can heighten feelings of inadequacy when academic goals are unmet (Rudnik et al., 2025). Understanding how time pressure contributes to academic stress is essential for developing strategies to enhance student resilience.

The JDR model provides a robust framework for analyzing these dynamics, suggesting that academic demands like time pressure can lead to adverse psychological outcomes when resources are insufficient (Qiang et al., 2024). For instance, students lacking time management skills or institutional support are more vulnerable to the depleting effects of time pressure (Jonge & Huter, 2021). Conversely, access to resources such as counseling or peer support can mitigate these effects, fostering better coping mechanisms and academic outcomes. This framework is particularly relevant in Samarinda, where cultural values influence the availability and perception of such resources, shaping students' ability to navigate academic challenges (Alsaif et al., 2024).

Cultural factors are central to the experience of cognitive fatigue and academic stress in Indonesia. The collectivist ethos, which prioritizes group harmony and familial expectations, imposes additional burdens on students to succeed academically (Hidayat & Hasim, 2023). This cultural context distinguishes the Indonesian academic experience from Western settings, where individual autonomy is often emphasized (Noreen et al., 2021). The phenomenon of jam koma exemplifies these cultural nuances, serving as a local expression of cognitive fatigue driven by the interplay of academic and social pressures (Qiang et al., 2024). By examining jam koma within Samarinda's academic environment, this study addresses a critical gap in understanding culturally specific psychological phenomena.

Demographic variables, namely age and gender, are included as control variables due to their potential to moderate the effects of time pressure. Younger students may experience heightened stress due to less developed coping mechanisms, while older students may leverage greater life experience to manage academic demands (Yosep et al., 2024). Gender dynamics also play a role, with female students often reporting higher anxiety levels, particularly in collectivist cultures where gender roles impose additional social expectations (Alsaif et al., 2024). However, in Indonesia's collectivist context, these differences may be less pronounced, as shared cultural expectations for academic success apply across genders (Altaf et al., 2022). Analyzing these variables ensures a comprehensive examination of time pressure's impact.

The rationale for this study is rooted in the growing prevalence of mental health challenges among Indonesian undergraduate students, with increasing reports of anxiety and burnout in academic settings (Hidayat & Hasim, 2023). Samarinda, as a key educational hub in East Kalimantan, offers a unique case study, with its students navigating a blend of traditional values and modern academic demands. The long-term consequences of cognitive fatigue and academic stress, including psychological disorders and reduced academic engagement, underscore the urgency of addressing these issues (Yosep et al., 2024). Prolonged exposure to stressors like time pressure can lead to conditions such as depression, with implications extending beyond academia (Qiang et al., 2024). By elucidating the relationships between time pressure, jam koma, and academic stress, this study provides empirical grounds for institutional interventions to support student well-being.

The state of the art in this field reveals a robust body of research on academic stress and cognitive fatigue, yet significant gaps persist. While studies have explored time pressure's effects in Western contexts, there is a scarcity of research addressing non-Western settings, particularly Indonesia's collectivist culture (Nweke et al., 2024). The concept of jam koma is largely absent from global literature, despite its prevalence in Indonesia, representing a critical gap in understanding culturally specific manifestations of cognitive fatigue (Laato et al., 2020). Furthermore, existing research often relies on unidimensional measures of fatigue, which may fail to capture the emotional and cognitive complexities of jam koma (Pedro Varandas et al., 2022). This study addresses these gaps by adopting a multidimensional approach to cognitive fatigue and situating the analysis within Samarinda's cultural context.

The novelty of this research lies in its exploration of jam koma as a cultural indicator of cognitive fatigue, bridging local and global perspectives on student mental health. By focusing on Samarinda's undergraduate students, the study offers insights into a population navigating unique socio-cultural pressures. The application of the JDR model to this context enhances its theoretical contribution, extending the model's relevance to higher education in non-Western settings (Hlad'o & Harvánková, 2024). Additionally, the study's emphasis on institutional interventions aligns with emerging evidence on effective strategies for mitigating academic stress (McCabe et al., 2023).

Institutional interventions offer promising avenues for addressing time pressure's adverse effects. Time management training has been shown to enhance task prioritization and reduce cognitive overload, empowering students to navigate academic demands more effectively (McCabe et al., 2023). Mental health support services, such as counseling and stress management programs, are equally critical, equipping students with strategies to manage jam koma and academic stress (Jonge & Huter, 2021). Incorporating physical activity into academic routines can further alleviate fatigue and improve well-being, offering a holistic approach to student support (Yosep et al., 2024). These interventions are particularly relevant in Samarinda, where cultural pressures underscore the need for tailored support systems (Rudnik et al., 2025).

The practical implications of this research are significant. Universities in Samarinda can leverage these findings to implement targeted interventions, such as flexible scheduling, peer mentoring, or mindfulness programs, to mitigate time pressure's impact (McCabe et al., 2023). By fostering a supportive academic environment, institutions can enhance student resilience and productivity, aligning with broader educational goals. The study also contributes to educational psychology by highlighting the intersection of cultural, psychological, and institutional factors in shaping student outcomes.

This study addresses three research questions: (1) How does time pressure influence jam koma (cognitive fatigue) among undergraduate students in Samarinda? (2) How does time pressure affect academic stress in this population? (3) Do age and gender moderate these relationships? The objective is to provide robust empirical evidence to inform educational policy and practice, with a focus on culturally informed interventions. Using a quantitative approach, the study examines these relationships through validated instruments and regression analysis, ensuring methodological rigor.

The JDR model underpins the analysis, emphasizing the interplay between academic demands and resources in shaping student outcomes. Time pressure, as a primary demand, is hypothesized to overwhelm students' cognitive and emotional resources, leading to jam koma and academic stress (Hlad'o & Harvánková, 2024). This hypothesis is supported by evidence linking high academic demands to reduced well-being (Nweke et al., 2024). In Samarinda, cultural factors, such as collectivism and familial expectations, amplify these effects, distinguishing the local experience from Western academic context (Lynch et al., 2022). By focusing on Samarinda's undergraduate students and exploring jam koma as a cultural phenomenon, it offers insights that are both locally relevant and globally significant. The findings have the potential to inform institutional strategies for supporting student well-being, fostering healthier and more productive academic communities.

2. Research Methods

This study utilized a quantitative cross-sectional survey design to investigate the impact of time pressure on cognitive fatigue, locally termed jam koma, and academic stress among undergraduate students in Samarinda, Indonesia. The research targeted active undergraduate students enrolled across multiple universities in Samarinda, East Kalimantan. The sample size was determined using the formula proposed by Hair et al. (2019), which recommends a minimum of five respondents per indicator to ensure adequate statistical power. This study involves three main variables: time pressure with 5 indicators (e.g., feelings of urgency, deadline anxiety), jam koma (cognitive fatigue) with 5 indicators (e.g., difficulty concentrating, mental fatigue), and academic stress with 5 indicators (e.g., overwhelming workload, family pressure), resulting in a total of 15 indicators. Based on a 5:1 ratio, the minimum required sample size is $15 \times 5 = 75$ respondents. To enhance reliability and account for potential incomplete data, this study targets 150 respondents. This number is considered sufficient for simple linear regression analysis and is aligned with the study's research capacity. A purposive sampling technique was employed to select 150 participants who met specific inclusion criteria: active undergraduate status, aged 18–25 years, and willingness to provide informed consent. This sampling approach ensured the selection of respondents relevant to the study's focus on academic stressors within a collectivist cultural context (Yosep et al., 2024). Data collection was conducted between April and May 2025 using online questionnaires distributed via Google Forms,

a method chosen for its accessibility and efficiency in reaching a geographically dispersed student population (Chen et al., 2021).

Three validated instruments, adapted for cultural relevance to the Indonesian context, were used to measure the study variables. The Perceived Time Pressure Scale (PTPS), comprising 5 items, assessed time pressure using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Items were tailored to reflect academic scenarios common in Indonesia, such as deadlines for assignments and examinations (Gusy et al., 2021). The Cognitive Failure Questionnaire (CFQ), modified to 5 items, measured cognitive fatigue with a focus on jam koma symptoms, such as difficulty concentrating and mental exhaustion, using the same Likert scale. Modifications ensured alignment with cultural expressions of fatigue in Samarinda (Qiang et al., 2024). The Perceived Stress Scale (PSS-5), a 5-item adaptation of the original PSS, evaluated academic stress, capturing feelings of anxiety and overwhelm related to academic demands. The PSS has been validated in Asian academic settings, demonstrating robust psychometric properties (Chen et al., 2021).

Instrument validity was established through Product Moment Correlation, requiring item-to-total correlations above 0.3 to ensure each item adequately represented its construct (Laato et al., 2020). Reliability was assessed using Cronbach's Alpha, with a threshold of 0.7 or higher to confirm internal consistency, a standard met by all instruments in prior validations (Hidayat & Hasim, 2023; Noreen et al., 2021). Age was recorded in years as a continuous variable, and gender was coded as a dummy variable (male = 1, female = 0) to facilitate regression analysis.

Data analysis was performed using SPSS version 26. Descriptive statistics, including means, standard deviations, skewness, and kurtosis, were computed to characterize the distribution of time pressure, cognitive fatigue, and academic stress. Normality was tested using the Shapiro-Wilk test, requiring p-values above 0.05 to confirm suitability for parametric analysis. Linear relationships between time pressure and the dependent variables were verified using Curve Estimation, ensuring the appropriateness of linear regression models (Yosep et al., 2024).

Two regression models were employed to test the study's hypotheses (Kesuma et al., 2025). Model 1 examined time pressure as the sole predictor of cognitive fatigue and academic stress, while Model 2 incorporated age and gender as control variables to isolate the effect of time pressure. The regression equations for cognitive fatigue (CF) and academic stress (AS) are expressed as follows:

For Model 1:

$$CF = \beta_0 + \beta_1 TP + \epsilon \quad (1)$$

$$AS = \beta_0 + \beta_1 TP + \epsilon \quad (2)$$

For Model 2:

$$CF = \beta_0 + \beta_1 TP + \beta_2 Age + \beta_3 Gender + \epsilon \quad (3)$$

$$AS = \beta_0 + \beta_1 TP + \beta_2 Age + \beta_3 Gender + \epsilon \quad (4)$$

Where :

CF = Jam koma (cognitive fatigue)

AS = Academic stress

TP = Time pressure

β_0 = Intercept

$\beta_1, \beta_2, \beta_3$ = Regression coefficients

ϵ = Error term

Multicollinearity was assessed using the Variance Inflation Factor (VIF), with a threshold below 10 to ensure independence among predictors (Nweke et al., 2024). The online data collection method using Google Forms was selected for its practicality in a post-pandemic academic environment, where digital platforms have become standard for survey distribution (Chen et al., 2021). To ensure response quality, questionnaires included attention-

check items, and incomplete submissions were excluded during data cleaning. The sample size of 150 was determined based on power analysis, ensuring sufficient statistical power to detect moderate effect sizes in regression models, consistent with prior studies on academic stress (Noreen et al., 2021).

Ethical considerations were rigorously upheld. Participants provided informed consent, and anonymity was ensured through de-identified data collection, adhering to ethical standards for social research (Nweke et al., 2024). Data were securely stored to protect confidentiality.

3. Results and Discussions

This study examined the effects of time pressure on jam koma (cognitive fatigue) and academic stress among 150 undergraduate students in Samarinda, with age and gender as control variables. Results are presented systematically, followed by a comprehensive discussion linking findings to theoretical frameworks and cultural contexts.

Descriptive statistics indicated that time pressure exhibited a near-normal distribution with a slight left skew, reflecting varied perceptions among students. Cognitive fatigue showed a symmetrical distribution, suggesting a range of fatigue levels from mild to severe. Academic stress was similarly normally distributed, with most students reporting moderate stress. No missing data were observed, and data variability supported regression analysis.

Instrument validity was confirmed using Product Moment Correlation (Table 1).

Table 1. Summary of Instrument Validity

Construct	Item	Correlation with Total Score	Validity Status
Time Pressure	TP1	0.736**	Valid
	TP2	0.708**	Valid
	TP3	0.798**	Valid
	TP4	0.787**	Valid
	TP5	0.774**	Valid
Jam Koma	CF1	0.783**	Valid
	CF2	0.776**	Valid
	CF3	0.773**	Valid
	CF4	0.773**	Valid
	CF5	0.804**	Valid
Academic Stress	AS1	0.777**	Valid
	AS2	0.769**	Valid
	AS3	0.697**	Valid
	AS4	0.753**	Valid
	AS5	0.756**	Valid

Note: **p < 0.01 (2-tailed), N = 150.

All items demonstrated significant correlations with their respective constructs, validating the instruments. Reliability was assessed using Cronbach's Alpha (Table 2).

Table 2. Summary of Instrument Reliability

Construct	Cronbach's Alpha	Items	Reliability Status
Time Pressure	0.817	5	Reliable
Jam Koma	0.840	5	Reliable
Academic Stress	0.803	5	Reliable

Note: N = 150, Alpha > 0.7 indicates reliability.

The Shapiro-Wilk test confirmed normality ($p > 0.05$) for all variables. Curve Estimation verified linear relationships ($p < 0.05$). Regression results are summarized in Table 3.

Table 3. Summary of Linear Regression Results

Dependent Variable	Model	Predictor	B	Beta	t	p	R ²	Adjusted R ²	F	p (Model)
Jam Koma	1	(Constant)	4.567		3.960	0.000	0.412	0.408	103.623	0.000
		Time Pressure	0.730	0.642	10.180	0.000				
	2	(Constant)	9.512		1.634	0.104	0.423	0.411	35.612	0.000
		Time Pressure	0.733	0.644	10.128	0.000				
		Age	-0.242	-0.052	-0.814	0.417				
Academic Stress	1	(Constant)	2.972		3.029	0.003	0.522	0.519	161.473	0.000
		Time Pressure	0.775	0.722	12.707	0.000				
	2	(Constant)	4.924		0.987	0.325	0.524	0.514	53.614	0.000
		Time Pressure	0.776	0.723	12.519	0.000				
		Age	-0.094	-0.021	-0.370	0.712				
		Gender	-0.398	-0.042	-0.737	0.462				

Note: N = 150,

Gender (Male = 1,

Female = 0).

The regression analysis for jam koma (cognitive fatigue) revealed that time pressure accounts for 41.2% of the variance in Model 1 ($R^2 = 0.412$, Adjusted $R^2 = 0.408$), with a significant model fit ($F = 103.623$, $p < 0.001$). The regression coefficient for time pressure ($B = 0.730$, $p < 0.001$) indicates that a one-unit increase in perceived time pressure elevates cognitive fatigue by 0.730 units. In Model 2, incorporating age and gender slightly increased the variance explained ($R^2 = 0.423$, Adjusted $R^2 = 0.411$), but neither age ($B = -0.242$, $p = 0.417$) nor gender ($B = -0.849$, $p = 0.181$) was significant. Time pressure remained a robust predictor ($B = 0.733$, $p < 0.001$). Diagnostic checks confirmed no multicollinearity (Tolerance > 0.977 , VIF < 1.024), ensuring the reliability of the regression model.

For academic stress, Model 1 demonstrated that time pressure explains 52.2% of the variance ($R^2 = 0.522$, Adjusted $R^2 = 0.519$), with a significant model ($F = 161.473$, $p < 0.001$). The coefficient for time pressure ($B = 0.775$, $p < 0.001$) suggests that a one-unit increase in time pressure heightens academic stress by 0.775 units. In Model 2, the inclusion of age and gender marginally raised the R^2 to 0.524 (Adjusted $R^2 = 0.514$), yet age ($B = -0.094$, $p = 0.712$) and gender ($B = -0.398$, $p = 0.462$) were non-significant. Time pressure's effect persisted ($B = 0.776$, $p < 0.001$), with no multicollinearity (VIF < 1.024).

These findings affirm that time pressure significantly influences both cognitive fatigue and academic stress, directly addressing the study's core research questions. The substantial effect on cognitive fatigue ($R^2 = 0.412$) indicates that approximately 41% of the variability in students' mental exhaustion can be attributed to the perception of limited time for academic tasks. The positive regression coefficient ($B = 0.733$) underscores a strong relationship, where heightened time pressure intensifies cognitive fatigue, manifesting as impaired focus and diminished mental stamina, locally termed jam koma. This aligns with the Job Demands-Resources (JDR) model, which posits that excessive demands, such as time pressure, deplete cognitive resources, leading to exhaustion (Hlad'o & Harvánková, 2024). In Indonesia, jam koma transcends a mere psychological symptom, embodying a cultural expression of cognitive overload, particularly prevalent during demanding academic periods like examinations (Hidayat & Hasim, 2023).

The impact of time pressure on academic stress is even more pronounced, with 52% of the variance explained ($R^2 = 0.522$). The coefficient ($B = 0.776$) highlights that increased time pressure exacerbates feelings of overwhelm, anxiety, and inability to meet academic demands. This finding corroborates prior research identifying time pressure as a primary driver of stress among students (Nweke et al., 2024). Within the JDR framework, time pressure acts as a high academic demand, triggering stress responses when resources like social support or time management

skills are insufficient. Indonesia's collectivist culture, marked by familial expectations and societal emphasis on academic success, amplifies this effect, as students face intense pressure to excel (Hidayat & Hasim, 2023).

The inclusion of age and gender as control variables yielded no significant effects on cognitive fatigue ($p = 0.417$ for age; $p = 0.181$ for gender) or academic stress ($p = 0.712$ for age; $p = 0.462$ for gender). The minimal increase in variance explained (1.1% for cognitive fatigue; 0.2% for academic stress) suggests that these controls contribute little to the model. The non-significance of gender contrasts with studies reporting higher stress among female students (Dhir et al., 2019). However, in Indonesia's collectivist context, academic pressures appear uniformly experienced across genders, likely due to shared societal expectations for achievement. The lack of age effects may stem from the sample's homogeneity, comprising undergraduate students with a narrow age range, limiting variability (Hidayat & Hasim, 2023).

The instruments' validity and reliability bolster the findings' credibility. High Product Moment Correlations (Table 1) confirm that questionnaire items accurately measure time pressure, cognitive fatigue, and academic stress, with culturally relevant adaptations for Indonesian students. Cronbach's Alpha values exceeding 0.8 (Table 2) indicate strong internal consistency, aligning with standards for psychological instruments like the Perceived Stress Scale validated in non-Western contexts (Laato et al., 2020). Data normality (Shapiro-Wilk $p > 0.05$) and linear relationships further validate the regression analysis.

The findings carry significant implications for Indonesia's higher education context. *Jam koma*, as a cultural phenomenon, highlights the unique cognitive challenges students face in competitive academic settings. This fatigue not only hampers academic performance but also undermines mental well-being and productivity, as evidenced by its positive association with time pressure. The study advocates for institutional strategies, such as time management workshops, counseling services, or flexible academic schedules, to alleviate deadline-related burdens (Hidayat & Hasim, 2023). Moreover, *jam koma* may serve as an early indicator of chronic fatigue, potentially progressing to severe mental health issues like anxiety if unaddressed.

The pronounced effect on academic stress underscores the need for holistic approaches to student well-being. The higher R^2 for academic stress compared to cognitive fatigue reflects time pressure's significant emotional impact. In collectivist societies, familial and societal expectations intensify this stress, adding psychological burdens (Nweke et al., 2024). Universities could implement stress-coping workshops or mentorship programs to support students. The findings also expose gaps in Indonesia's institutional resources, such as limited mental health services, which require urgent attention (Hidayat & Hasim, 2023; Loch et al., 2023).

Globally, time pressure's role in driving stress and fatigue is universal, but Indonesia's cultural context adds distinct nuances. Western studies often overlook cultural manifestations like *jam koma*, making this study's focus on a non-Western context a novel contribution (Laato et al., 2020). The findings align with human resource management principles, viewing students as assets whose well-being must be optimized for academic productivity (Hlad'o & Harvánková, 2024). Limitations include the cross-sectional design, which restricts causal inferences. The non-significance of age and gender may reflect sample homogeneity, suggesting future studies with broader demographic variability (Laato et al., 2020).

Theoretically, the study reinforces the JDR model's applicability to Indonesian higher education, with time pressure as a critical demand affecting student well-being. Practically, universities can use these insights to design interventions like flexible schedules or mental health programs. Future research could adopt longitudinal designs to track time pressure's long-term effects or include variables like social support to provide a more comprehensive understanding.

4. Conclusion

This study confirms that time pressure significantly influences cognitive fatigue, locally known as *jam koma*, and academic stress among undergraduate students in Samarinda, Indonesia. The findings reveal that heightened perceptions of limited time for academic tasks substantially contribute to mental exhaustion and feelings of anxiety, overwhelm, and inability to cope with academic demands. In contrast, age and gender demonstrate negligible effects, suggesting that time pressure's impact transcends demographic differences within this collectivist academic context. These results directly address the research objectives, establishing time pressure as a critical driver of psychological strain among students. The cultural phenomenon of *jam koma* emerges as a distinctive manifestation of cognitive fatigue, offering a unique perspective on how academic pressures manifest in Indonesia's higher education system. The findings underscore the urgent need for institutional interventions to enhance student well-being. Practical applications include the implementation of time management workshops,

peer mentoring programs, and flexible academic scheduling to alleviate deadline-related pressures. Additionally, mental health support services, such as counseling and stress management training, could equip students with strategies to mitigate jam koma and academic stress. These interventions hold potential to foster a more supportive academic environment, improving student resilience and productivity. The study speculates that unaddressed time pressure may lead to long-term consequences, including chronic fatigue and psychological disorders, which could hinder academic and personal development. For future research, longitudinal studies are recommended to explore the temporal dynamics of time pressure's effects on student mental health. Incorporating additional factors, such as social support, academic motivation, or institutional resources, could provide a more comprehensive understanding of these relationships. Furthermore, comparative analyses across different cultural contexts may clarify whether jam koma is unique to Indonesia or reflective of broader academic experiences in collectivist societies. By addressing these avenues, subsequent research can build on these findings to develop targeted strategies for supporting undergraduate students, ensuring healthier and more equitable academic communities in Samarinda and beyond.

References

- [1] Alsaif, B., Hassan, S.-N., Alzain, M. A., Almishaal, A. A., & Zahra, A. (2024). Cognitive Flexibility's Role in Reducing Academic Stress During the COVID-19 Pandemic. *Psychology Research and Behavior Management*. <https://doi.org/10.2147/prbm.s451211>
- [2] Altaf, S., Aftab, A., Khan, K. F., Anwar, F., Imran, A., & Syed, M. (2022). Association of Sleep-Wake Pattern With Cognitive Performance and Academic Achievement in Young Adults. *Journal of the Pakistan Medical Association*. <https://doi.org/10.47391/jpma.2087>
- [3] Chen, J., Chin, W., Tiwari, A., Ha Wong, J. Y., K. Wong, I. C., Worsley, A. J., Feng, Y., Sham, M. H., Yan Tsang, J. P., & Lau, C. S. (2021). Validation of the Perceived Stress Scale (PSS-10) in Medical and Health Sciences Students in Hong Kong. *The Asia Pacific Scholar*. <https://doi.org/10.29060/taps.2021-6-2/oa2328>
- [4] Dhir, A., Kaur, P., Chen, S., & Pallesen, S. (2019). Antecedents and Consequences of Social Media Fatigue. *International Journal of Information Management*. <https://doi.org/10.1016/j.ijinfomgt.2019.05.021>
- [5] Gusy, B., Lesener, T., & Wolter, C. (2021). Time Pressure and Health-Related Loss of Productivity in University Students: The Mediating Role of Exhaustion. *Frontiers in Public Health*. <https://doi.org/10.3389/fpubh.2021.653440>
- [6] Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- [7] Hidayat, M. T., & Hasim, W. (2023). Putting It Off Until Later: A Survey-Based Study on Academic Procrastination Among Undergraduate Students. *Journal of Educational Cultural and Psychological Studies (Ecps Journal)*. <https://doi.org/10.7358/ecps-2023-028-taha>
- [8] Hlad'o, P., & Harvánková, K. (2024). Teachers' Perceived Work Ability: A Qualitative Exploration Using the Job Demands-Resources Model. *Humanities and Social Sciences Communications*. <https://doi.org/10.1057/s41599-024-02811-1>
- [9] Jonge, J. de, & Huter, F. F. (2021). Does Match Really Matter? The Moderating Role of Resources in the Relation Between Demands, Vigor and Fatigue in Academic Life. *The Journal of Psychology*. <https://doi.org/10.1080/00223980.2021.1924603>
- [10] Kesuma, M. R., Henrika S., M., Ariswati, L. D., Widaryo, C. M., Irianto, E. D. O., & Aini, R. N. (2025). Exploring Climate Risk Effects on Financial Performance in Energy Sector. *RIGGS: Journal of Artificial Intelligence and Digital Business*, 4(2), 235–241. <https://doi.org/10.31004/riggs.v4i2.483>
- [11] Laato, S., Islam, A. K. M. N., Islam, M. N., & Whelan, E. (2020). What Drives Unverified Information Sharing and Cyberchondria During the COVID-19 Pandemic? *European Journal of Information Systems*. <https://doi.org/10.1080/0960085x.2020.1770632>
- [12] Loch, F., Ferrauti, A., Meyer, T., Pfeiffer, M., & Kellmann, M. (2023). Acute Effects of Mental Recovery Strategies in Simulated Air Rifle Competitions. *Frontiers in Sports and Active Living*. <https://doi.org/10.3389/fspor.2023.1087995>
- [13] Loroheema Soumilena, J. R., Widyorini, E., & Eryani, P. (2023). Relationship Between Self-Regulated Learning and Task Aversiveness With Academic Procrastination in High School Students in the Affirmation

Program for Secondary Education. *Counsnesia Indonesian Journal of Guidance and Counseling*.
<https://doi.org/10.36728/cijgc.v4i2.2576>

- [14] Lynch, J., O'Donoghue, G., & Peiris, C. L. (2022). Classroom Movement Breaks and Physically Active Learning Are Feasible, Reduce Sedentary Behaviour and Fatigue, and May Increase Focus in University Students: A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health*. <https://doi.org/10.3390/ijerph19137775>
- [15] McCabe, J. A., Banasik, C. S., Jackson, M. G., Postlethwait, E. M., Steitz, A., & Wenzel, A. R. (2023). Exploring Perceptions of Cognitive Load and Mental Fatigue in Pandemic-Era Zoom Classes. *Scholarship of Teaching and Learning in Psychology*. <https://doi.org/10.1037/stl0000347>
- [16] Nieuwoudt, J. (2023). Improving the Academic Performance and Mental Health of Non-Traditional University Students Through a Shorter Delivery Model: Exploring the Impact of the Southern Cross Model. *Student Success*. <https://doi.org/10.5204/ssj.2660>
- [17] Noreen, S., Ghayas, S., Khalid, S., & Awan, S. M. (2021). Construction and Validation of Academic Stress Scale for University Students. *Pakistan Journal of Education*. <https://doi.org/10.30971/pje.v38i2.1603>
- [18] Nweke, G. E., Jarrar, Y., & Horoub, I. (2024). Academic Stress and Cyberloafing Among University Students: The Mediating Role of Fatigue and Self-Control. *Humanities and Social Sciences Communications*. <https://doi.org/10.1057/s41599-024-02930-9>
- [19] Pedro Varandas, R. S., Lima, R., i Badia, S. B., Silva, H., & Gambôa, H. (2022). Automatic Cognitive Fatigue Detection Using Wearable fNIRS and Machine Learning. *Sensors*. <https://doi.org/10.3390/s22114010>
- [20] Qiang, J., He, X., Zheng, X., Huang, J., & Xu, C. (2024). The Association Between Intolerance of Uncertainty and Academic Burnout Among University Students: The Role of Self-Regulatory Fatigue and Self-Compassion. *Frontiers in Public Health*. <https://doi.org/10.3389/fpubh.2024.1441465>
- [21] Rudnik, A., Sobczak, K., Sawicki, A., & Zdun-Ryżewska, A. (2025). Exploring the Interplay of Stress, Fatigue, and Empathy: The Mediating Role of Cognitive Flexibility in Enhancing the Well-Being of University Students in Medical and Social Disciplines. *Plos One*. <https://doi.org/10.1371/journal.pone.0321946>
- [22] Yosep, I., Sakti, D. W., Mardhiyah, A., Maulana, I., Hernawaty, T., & Lukman, M. (2024). Screen Fatigue During Online Learning Among First Grade of Nursing Students. *Jurnal Keperawatan Komprehensif*. <https://doi.org/10.33755/jkk.v10i2.631>