15 (2) (2026) 521-527

Journal of Physical Education, Sport, Health and Recreations

http://journal.unnes.ac.id/journals/peshr

Significant Negative Relationship Between Running Habit and Academic Stress in Final-Year Students of UNNES

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Keywords

running habit; academic stress; final-year students; Spearman correlation; physical activity

Abstract

Final-year students face peak academic pressure in the form of thesis writing, which can potentially cause academic stress. Physical activities such as running have emerged as a popular coping strategy; however, the quantitative relationship between natural running habits and academic stress among final-year students has not been extensively studied. This study aimed to analyze the relationship between running habits and academic stress among final-year students of Universitas Negeri Semarang (UNNES). A quantitative approach with a correlational design was employed. A sample of 130 final-year UNNES students from the class of 2022 who were working on their theses was selected using purposive sampling. Running habits were measured using an adaptation of the Godin Leisure-Time Exercise Questionnaire (GLTEQ), converted to MET per week. Academic stress was measured using an adaptation of the Educational Stress Scale for Adolescents (ESSA) with a 4-point Likert scale. Data were analyzed using Spearman's correlation test. The results showed that students' running habits were very low (mean MET per week = 74.43) and the average academic stress score was in the moderate category (mean = 36.91 out of 64). Spearman's correlation test revealed a significant negative relationship between running habits and academic stress ($r_s = -0.246$; $p = 0.005$), with a contribution of only 6.1%. In conclusion, there is a significant but weak negative relationship between running habits and academic stress. Running is beneficial as a stress management strategy but is not a single determining factor.

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p-ISSN 2460-724X
e-ISSN 2252-6773

INTRODUCTION

Mental health among Generation Z university students has become a global concern. The World Health Organization (WHO) reported a significant increase in mental disorders among adolescents and young adults, the age group that includes Generation Z with stress as a major contributor (World Health Organization, 2022). This context is increasingly complex in Indonesian higher education, where final-year students face peak academic pressure in the form of thesis writing. A systematic review by (Ferdiyanto et al., 2025) mapped that the pressure to complete studies on time, accumulated assignments, and the demand for quality scientific work are the main triggers of academic stress in Indonesia. This phenomenon has been observed at Universitas Negeri Semarang (UNNES), where a preliminary study showed that the thesis is the main source of stress for 75% of its Generation Z students (Javier & Chanifuddin, 2024).

Initial observations in February 2026 involving 12 final-year UNNES students (6 regular runners, 6 non-runners) reinforced these findings. All respondents reported academic stress symptoms, with sleep disturbances being the most common. One student stated, "I often feel sleepy but can't sleep, suddenly I think about my future." Indications of stress also appeared as silent behavior and daydreaming. Another respondent admitted, "When I'm alone, I often daydream, especially when I'm stuck on my thesis." These findings confirm that silent behavior can be an indicator of academic stress.

Amidst this pressure, running has emerged as a popular coping strategy. All regular runner respondents reported psychological benefits after running. One respondent called running "medicine... after running, all the pain instantly heals." Another added, "After running, my brain feels fresh and enthusiastic again." The fear of missing out (FOMO) initially encouraged students to start running, but after experiencing benefits, they made it a sustainable habit. Direct observation showed that regular runners (habit >6 months) had stable breathing and efficient movements, while beginners quickly ran out of breath with stiff form—indicating that intensity and consistency affect psychological benefits. Thus, running is not just a Generation Z lifestyle but has potential as a natural intervention for managing academic stress.

At UNNES, understanding effective stress coping strategies that suit Generation Z characteristics is urgent. Generation Z, raised with high digitalization, experiences technostress but also has access to mental health information. Interventions that are too structured or rigid may not suit their preference for flexibility and autonomy. Therefore, encouraging healthy habits they already enjoy, such as running may be a more acceptable and sustainable approach.

Scientific evidence consistently shows a negative correlation between physical activity and depression or anxiety symptoms, even during high-stress periods such as the pandemic (Wolf et al., 2021). A recent systematic review confirmed that physical activity significantly reduces perceived stress and improves mental health in university students (Martín-Rodríguez & González-Prieto, 2026). In Indonesia, a study on medical students found a significant negative relationship between physical activity levels and academic stress (Nurjanah & Sari, 2024). Similarly, (Saputri et al., 2023) reported that higher physical activity is associated with lower anxiety and stress levels among college students. (Khandare, 2024) found that students use running as a cognitive distraction mechanism, diverting thoughts from academic anxiety while improving post running mood. An experimental study at UNNES even proved that structured light running intervention could reduce psychological stress scores by 42% in Generation Z students (Javier & Chanifuddin, 2024).

Despite documented evidence on running motivation for stress coping and the general benefits of physical activity on academic stress, a quantitative gap remains. What is known: Physical activity, including running, reduces stress in structured interventions. What is missing: The relationship between natural (non-interventional) running habits and academic stress among final-year Generation Z students has not been quantified. Most studies, including (Javier & Chanifuddin, 2024), measured the impact of structured interventions. In reality, many students run independently with varying motivations and patterns. Measuring the strength of this natural relationship will provide a more authentic picture of running's role as a stress buffer in the real academic ecosystem.

Based on the identification of these research gaps, this study was designed to analyze the relationship between running habits (defined as frequency, duration, and intensity of running

measured using an adaptation of the Godin Leisure-Time Exercise Questionnaire) and academic stress (measured using an adaptation of the Educational Stress Scale for Adolescents/ESSA) among final-year Generation Z students at UNNES. The research questions are: (1) How is the running habit description among final-year students of UNNES? (2) How is the academic stress level description among final-year students of UNNES? (3) Is there a significant relationship between running habit and academic stress among final-year students of UNNES? The objectives of this study are to describe running habits, describe academic stress levels, and analyze the relationship between the two variables. The research hypothesis (H_a) states that there is a significant negative relationship between running habit and academic stress among final-year students of UNNES, while the null hypothesis (H_0) states that there is no significant negative relationship between running habit and academic stress among final-year students of UNNES. The findings of this correlational study are expected to provide a more contextual empirical basis for developing healthy campus policies and mental health promotion programs that utilize simple physical activities such as running, taking into account the unique motivations and natural habits of this generation.

METHODS

This study employed a quantitative approach with a correlational design. This design was chosen to identify the presence, direction, and strength of the relationship between running habits as the independent variable and academic stress as the dependent variable, without providing any intervention or treatment.

The research used a cross-sectional correlational design. Two adapted instruments were used to collect data. Running habits were measured using an adaptation of the Godin Leisure-Time Exercise Questionnaire (GLTEQ) (Godin, 2011). This instrument measures three components: (1) running frequency in the last 30 days converted to per week (0–5+ times), (2) average duration per session (categories: 1–15, 16–25, 26–35, 36–45, >45 minutes), and (3) subjective intensity (light, moderate, vigorous). The MET score per week was calculated using the formula: frequency × duration (minutes) × MET value, then multiplied by 7/30. The MET values used were: light intensity = 3, moderate = 5, vigorous = 8.

Academic stress was measured using an adaptation of the Educational Stress Scale for Adolescents (ESSA) version 16 items (Sun et al., 2011). For this study, the Likert scale was modified from 5 points to 4 points (1 = Never, 2 = Rarely, 3 = Often, 4 = Always) to eliminate the neutral midpoint. The total score range is 16–64, categorized as low (16–32), moderate (33–48), and high (49–64). Reliability testing on the research sample (n=130) yielded a Cronbach's Alpha of 0.932 (95% CI: 0.914–0.950), indicating excellent reliability.

The target population was all active students of Universitas Negeri Semarang (UNNES) class of 2022 who were in their 8th semester and in the process of thesis writing. The sample was selected using purposive sampling with inclusion criteria: (1) active student of class 2022, (2) currently working on their thesis, (3) willing to be a respondent (informed consent), and (4) having no medical conditions that limit strenuous physical activity. A total of 130 respondents were collected and analyzed, consisting of 65 males (50%) and 65 females (50%).

The data collected were primary quantitative data obtained directly from respondents through online questionnaires. The data included running habits (MET per week) and academic stress scores (total score of 16 items).

Data were collected online from March to April 2026 using the Google Forms platform. Questionnaires were distributed through WhatsApp group chats per faculty and study program, as well as other social media platforms. Before filling out the questionnaire, respondents were given informed consent explaining the research objectives, data confidentiality, and the right to withdraw. The time to complete the questionnaire was approximately 5–7 minutes.

Data analysis was performed using JASP software version 0.16. Descriptive analysis (mean, standard deviation, minimum, maximum, frequency, percentage) was used to describe sample characteristics and research variables. Normality testing was conducted using the Shapiro-Wilk test (because $n < 200$). Since one variable (MET per week) was not normally distributed ($p < 0.001$), the correlation test used was Spearman's rho. The significance level was set at $\alpha = 0.05$.

Interpretation of correlation strength followed (Guilford, 1956): 0.00–0.19 = very weak, 0.20–0.39 = weak, 0.40–0.59 = moderate, 0.60–0.79 = strong, 0.80–1.00 = very strong.

Validity of the adapted instruments was ensured by relying on the original validation studies of the GLTEQ (Godin, 2011) and ESSA (Sun et al., 2011), which have demonstrated acceptable construct and content validity. For this study, the adapted versions were reviewed by two experts to confirm relevance and clarity.

The research procedure is illustrated in Figure 1 below.

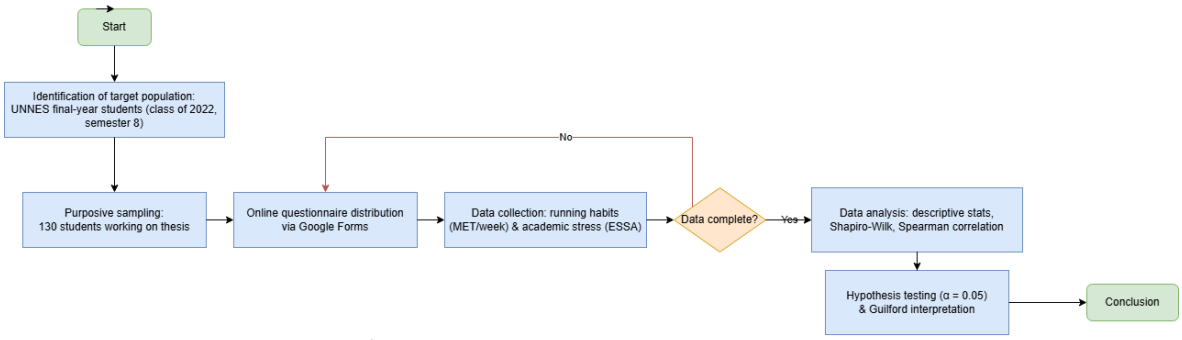


Figure 1. Research procedure flowchart

RESULTS AND DISCUSSION

Research Implementation

This research was conducted from March to April 2026. Data collection was carried out online via Google Forms for approximately four weeks. The questionnaire distribution targeted final-year students of Universitas Negeri Semarang (UNNES) class of 2022 who were actively working on their theses. A total of 130 respondents were successfully obtained and met the inclusion criteria, consisting of 65 males (50%) and 65 females (50%). The following sections describe the research findings in response to the three research questions.

Description of Running Habits and Academic Stress

Table 1 presents the descriptive statistics of the research variables.

Table 1. Descriptive statistics of research variables (n=130)

variable	Mean	SD	Min	Max
Running habit (MET per week)	74.43	106.8	0	466.7
Academic stress score (range 16-64)	36.91	10.96	16	64

The mean MET per week (74.43) is very low, far below the WHO recommended minimum of 600 MET-minutes per week for health benefits
(World Health Organization, 2020). Even the maximum value achieved by respondents (466.7) was still below this standard, indicating that all respondents had low running habits. The mean academic stress score (36.91 out of 64) falls into the moderate category (approximately 58% of the maximum score).

Table 2 shows the distribution of academic stress levels among respondents.

Table 2. Distribution of academic stress levels (n=130)

Category	Score Range	Frequency	Percentage
Low	16-32	44	33.8
Moderate	33-48	67	51.5
High	49-64	19	14.6

The majority of respondents (51.5%) experienced moderate academic stress during thesis writing, followed by low stress (33.8%) and high stress (14.6%). This finding indicates that final-year students tend to experience moderate stress due to thesis demands such as time pressure, repeated revisions, and high expectations from themselves and their parents.

Normality Test and Correlation Analysis

Before testing the hypothesis, a normality test using Shapiro-Wilk was conducted. The results showed that the MET per week data were not normally distributed ($p < 0.001$), while the academic stress data were normally distributed ($p = 0.160$). Therefore, Spearman's rho correlation test was used.

Table 3. Reliability test (Cronbach's Alpha)

Coefficient	Estimate	95% CI Lower	95% CI Upper
Cronbach's α	0.932	0.914	0.950

The Cronbach's Alpha value of 0.932 indicates excellent reliability, confirming that the 16-item ESSA instrument is consistent and suitable for measuring academic stress in this research population.

Table 4. Spearman correlation between running habit and academic stress (n=130)

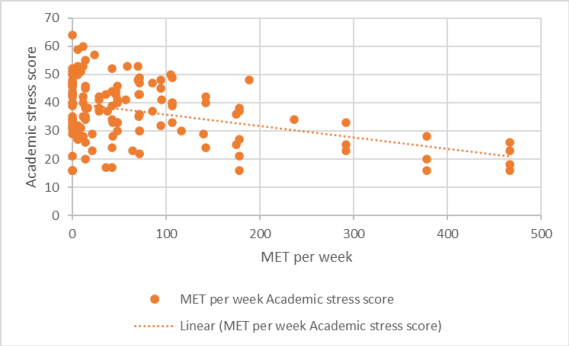
Variable 1	Variable 2	r_s	p-value
MET per week	Academic stress score	-0.246	0.005

The Spearman correlation coefficient of -0.246 indicates a negative direction (the higher the running habit, the lower the stress level) with weak strength according to Guilford's criteria (1956). The p-value of 0.005 is less than the significance level of 0.05, so the relationship is statistically significant. Thus, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted. The coefficient of determination ($r^2 = 0.061$) shows that running habit only contributes 6.1% to the variation in academic stress levels, while the remaining 93.9% is influenced by other factors outside this study.

Graphical Representation

Figure 1 presents a scatter plot of the relationship between running habit (MET per week) and academic stress score.

Figure 1. Scatter plot of running habit vs academic stress



Answering Research Questions

The first research question asked about the description of running habits among final-year UNNES students. The results showed that the mean MET per week was only 74.43, with all respondents below the recommended health standard. This indicates that most final-year students do not have a regular running routine, possibly due to academic busyness, lack of motivation, and environmental factors such as weather and limited facilities, as expressed in open-ended responses. This finding is consistent with studies in various Indonesian

universities reporting low physical activity levels among students, especially during thesis preparation.

The second research question concerned the description of academic stress levels. The mean stress score was 36.91 (moderate category), with more than half of the respondents (51.5%) experiencing moderate stress. This finding indicates that final-year students tend to experience moderate stress due to thesis demands such as time pressure, repeated revisions, and high expectations. The high proportion of students with moderate stress indicates that thesis writing is a psychologically challenging period requiring effective coping strategies.

The third research question asked whether there is a significant relationship between running habit and academic stress. The Spearman correlation test yielded r_s = -0.246 and p = 0.005, indicating a significant negative relationship, although weak. Thus, the research hypothesis (H_a) is accepted. This result is lower than (Khandare, 2024) finding of a strong negative correlation (r = -0.62) among Indian students. The difference may be due to differences in sample characteristics (Indonesian vs Indian students), measurement instruments, and academic context. Moreover, the running volume of respondents in this study was very low (mean MET 74.43), so the detected effect was smaller. In contrast, this finding is consistent with (Nurjanah & Sari, 2024) who also found a significant negative relationship among medical students in Indonesia. More recently, a longitudinal study by (Teuber et al., 2024) found that physical activity improves stress recovery and reduces dysfunctional stress among university students, supporting the direction of our findings despite the weak correlation.

Theoretical and Empirical Review

Several factors explain the weak relationship found. First, the very low running volume (mean MET 74.43, maximum 466.7) is far below the recommended minimum of 600 MET per week. With such low volume, the physiological and psychological effects of running on stress, such as endorphin release, improved sleep quality, and distraction from academic pressure (Nys et al., 2022) may not be optimal. However, even though low, the existing effect was still statistically detectable.

Second, biological and psychological mechanisms are at play. Physical activity such as running is known to reduce the stress hormone cortisol and increase endorphin production, which produces feelings of comfort (Wolf et al., 2021). Running can also function as a cognitive distraction, breaking the cycle of negative rumination about the thesis (Khandare, 2024). This result is consistent with the theory of physical activity as an effective coping strategy.

Third, the cross-sectional design is a limitation. This study cannot prove a causal relationship. Reverse causality is possible: stressed students tend to be lazy to run, rather than running causing stress reduction. However, the negative direction consistent with theory supports that running can be one stress management strategy.

Fourth, the weak relationship (r_s = -0.246) indicates that running habit only makes a small contribution to reducing academic stress. The coefficient of determination (r^2 = 0.061) shows that only 6.1% of the variation in stress levels can be explained by running habits. Other factors such as social support, time management, self-efficacy, personality, and economic conditions may have larger contributions (Bandura, 1997) (Cohen & Wills, 1985). Nevertheless, the statistically significant relationship still shows that running has a role, albeit small.

Final Findings for Conclusion

In summary, the results show that running habits among final-year UNNES students are very low, academic stress is at a moderate level, and there is a significant but weak negative relationship between running habits and academic stress. The contribution of running to stress variation is only 6.1%, indicating that other factors are much more dominant. Nevertheless, running remains a measurable beneficial activity for stress management.

CONCLUSION

Based on the results and discussion of this study involving 130 final-year students of Universitas Negeri Semarang (UNNES), several conclusions can be drawn. First, the running

habit of final-year UNNES students is very low, with a mean MET per week of 74.43. All respondents were below the WHO recommended minimum of 600 MET-minutes per week, indicating that running is not a regular activity among this population. Second, the academic stress level of final-year UNNES students is in the moderate category, with a mean score of 36.91 out of 64. The majority of respondents (51.5%) experienced moderate stress during thesis writing.

Third, there is a significant negative relationship between running habit and academic stress (r_s = -0.246; p = 0.005). However, the strength of this relationship is weak, and the contribution of running to stress variation is only 6.1% (r^2 = 0.061). Therefore, the research hypothesis (H_a) is accepted, but the practical effect is small. In conclusion, although running has a measurable beneficial effect on reducing academic stress, it is not a dominant factor. Other variables such as social support, time management, and self-efficacy may play larger roles. Nevertheless, promoting running as a simple, low-cost coping strategy remains relevant for final-year students.

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