



Association between academic stress and emotional eating among final-year thesis students in Aceh: A cross-sectional study

Hubungan stres akademik dengan perilaku emotional eating pada mahasiswa tingkat akhir penyusun skripsi di Aceh: Studi cross-sectional

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Abstract

Final-year university students are recognized as a population vulnerable to academic stress, particularly during the thesis-writing phase, with previous studies reporting high stress prevalence and associated maladaptive behaviors. However, evidence specifically examining emotional eating during this high-risk phase in Aceh remains limited. This study aimed to analyze the relationship between academic stress and emotional eating among final-year students. A quantitative cross-sectional study was conducted in November–December 2024, involving 50 final-year students selected through total sampling, representing the entire eligible population. The inclusion criteria were active students completing their thesis, while incomplete responses were excluded. Academic stress and emotional eating were measured using the Indonesian versions of the Educational Stress Scale for Adolescents (ESSA) and the Emotional Eater Questionnaire (EEQ), which demonstrated acceptable internal consistency. Data were analyzed using the Spearman's correlation test. Most respondents experienced moderate academic stress (80%), while emotional eating was predominantly moderate (54%) and severe (46%). A significant positive correlation was found between academic stress and emotional eating ($r^2 = 0.33$; $p = 0.018$). In conclusion, academic stress was moderately associated with increased emotional eating behavior among final-year students, highlighting the need for targeted stress management and behavioral interventions in the university setting.

Keywords: Emotional Eating; Academic Stress; Students; Cross-Sectional Studies; Eating Behavior

Abstrak

Mahasiswa tingkat akhir merupakan kelompok yang rentan mengalami stres akademik, terutama pada fase penyusunan skripsi, dengan berbagai studi sebelumnya menunjukkan tingginya prevalensi stres yang berkaitan dengan perilaku maladaptif. Namun, bukti yang secara khusus mengkaji emotional eating pada fase berisiko tinggi ini di Aceh masih terbatas. Penelitian ini bertujuan untuk menganalisis hubungan antara stres akademik dan emotional eating pada mahasiswa tingkat akhir. Penelitian kuantitatif dengan desain cross-sectional ini dilakukan pada November–Desember 2024 dengan melibatkan 50 mahasiswa tingkat akhir yang dipilih melalui total sampling, mewakili seluruh populasi yang memenuhi kriteria. Kriteria inklusi adalah mahasiswa aktif yang sedang menyusun skripsi, sedangkan data yang tidak lengkap dikeluarkan. Stres akademik dan emotional eating diukur menggunakan versi Indonesia dari Educational Stress Scale for Adolescents (ESSA) dan Emotional Eater Questionnaire (EEQ) yang memiliki konsistensi internal yang memadai. Analisis data menggunakan uji korelasi Spearman. Hasil, sebagian besar responden mengalami stres akademik tingkat sedang (80%), sedangkan

emotional eating didominasi kategori sedang (54%) dan berat (46%). Terdapat hubungan positif yang signifikan antara stres akademik dan emotional eating ($r = 0,33$; $p = 0,018$). Kesimpulannya, stres akademik berhubungan sedang dengan peningkatan perilaku emotional eating pada mahasiswa tingkat akhir, sehingga diperlukan intervensi pengelolaan stres dan perilaku yang terarah di lingkungan perguruan tinggi

Kata Kunci: Perilaku Makan, Stres Akademik, Mahasiswa, Studi Potong Lintang, Perilaku Makan

Introduction

Student mental health has become a public health issue that is gaining global attention because it is closely related to academic functioning, quality of life, and risk of physical health problems. Various international studies have reported that stress among students is common and is associated with an increased risk of mental disorders (Slimmen et al., 2022). Multi-country studies show that most students experience stress in at least one area of life, and there is a *dose-response* pattern between stress levels and an increased likelihood of experiencing mental disorders (Cletus et al., 2024; Huang et al., 2023; Karyotaki et al., 2020). These studies have reported that stress is not merely an academic burden but an important determinant that can affect overall health, including health behaviors such as eating patterns, dietary quality, and energy balance, which are directly related to nutritional status and the long-term risk of non-communicable diseases.

In higher education, academic stress often increases during critical transition phases, particularly among final-year students preparing their final assignments and theses. At this stage, academic demands collide with time pressures, family expectations, the need for timely publication/graduation, and the dynamics of the relationship with the supervisor (Ardi et al., 2025; Prameswari et al., 2022). Clinically and behaviorally, prolonged stress can disrupt emotional regulation and self-control, leading to the use of less adaptive coping strategies by the individual. One response that is widely discussed in health literature is emotional eating, which is the tendency to eat in response to negative emotions (e.g., anxiety, sadness, and depression), rather than physiological hunger. Clinical studies of students have shown that emotional eating can negatively impact physical and mental health and have implications for academic performance (Alexatou et al., 2025).

Theoretically, the relationship between stress and eating behavior can be explained through biological and psychological mechanisms. From a biological perspective, stress is associated with the activation of the hypothalamic-pituitary-adrenal (HPA) axis and hormonal changes that affect appetite and food preferences. The medical literature on obesity shows that chronic stress, cortisol, and appetite-related hormones (e.g., ghrelin and leptin) are associated with *food cravings* and weight changes in follow-up studies (Chao et al., 2017). From a psychological perspective, emotional eating is viewed as a behavior related to emotion regulation and *appetite self-regulation*; when emotion regulation abilities weaken, individuals are more likely to use food as a short-term "emotional reliever" (Chawner & Filippetti, 2024). This combination of biological and psychological mechanisms suggests that academic stress may not only influence eating behavior but also contribute to unhealthy dietary patterns through an increased preference for energy-dense foods and reduced self-regulation. Previous studies have consistently reported a positive association between perceived stress and emotional eating among students; however, the strength and consistency of this relationship vary across populations and contexts, indicating the need for context-specific investigations (Caso et al., 2020).

In Indonesia, mental health issues among young people are emerging. Data from the 2023 Indonesian Health Survey (IHS) show that the prevalence of depression among people aged ≥ 15 years nationwide is 1.4%, and the younger age group (15–24 years) has a notable proportion of several mental health indicators. At the provincial level, Aceh has a recorded prevalence of depression of 0.8% (aged ≥ 15 years) in the last two weeks. In addition, the Indonesian Health Survey (HIS) in 2023 also documented other psychological risk indicators, including the prevalence of people who have had

thoughts of ending their lives (in the last month); for Aceh, it was recorded at 0.15% and nationally at 0.25% (Kemenkes RI, 2023). These data indicate that mental health problems are present in the population, including among university students, and may be associated with maladaptive coping behaviors such as emotional eating. Previous evidence suggests that psychological distress, including depressive symptoms, is linked to changes in appetite, increased food cravings, and unhealthy eating behaviors, which are relevant to nutritional outcomes in older adults.

National evidence regarding the association between academic stress and eating behavior among students is beginning to emerge. Research on public health students in Indonesia has reported a relationship between academic stress levels and eating behavior (Nuramalia & Sumarmi, 2024). Another study on final-year students in Indonesia examined the relationship between stress and emotional eating in the context of students facing academic pressure at the end of their studies (Khaerunnisa et al., 2025). However, most national studies still focus on the general student population or specific faculty contexts, with limited attention paid to students in high-risk academic transition phases. Final-year students writing their theses represent a unique subgroup exposed to cumulative academic, psychological, and time-related stressors, which may intensify maladaptive eating behaviors. Furthermore, evidence from Aceh remains limited despite its distinct sociocultural and educational contexts, which may influence stress perception and coping behaviors, including eating patterns.

Final-year students writing their theses are at a high risk of academic stress due to academic demands, time pressure, and graduation expectations. Prolonged stress is known to be associated with emotional regulation disorders and the emergence of maladaptive coping behaviors, one of which is emotional eating (Yilmazturk et al., 2023). Nationally, data from the 2023 Indonesian Health Survey show emotional disorders in the ≥ 15 age group, including in Aceh Province (Kemenkes RI, 2023). Therefore, examining the relationship between academic stress and emotional eating in final-year students is important to better understand the behavior-related nutritional risks during a critical academic period. This evidence is essential for

informing targeted promotive and preventive interventions addressing both mental health and nutrition-related behaviors in university settings.

Based on the aforementioned issues, this study aimed to analyze the relationship between academic stress and emotional eating among final-year students writing their theses. It was hypothesized that higher levels of academic stress would be positively associated with increased emotional eating.

Methods

Research Design

This study employed a quantitative observational design with a cross-sectional approach to analyze the relationship between academic stress and emotional eating behavior among final-year students. All variables were measured at a single point in time; therefore, causal inferences could not be established, and the possibility of reverse causality could not be excluded from the study. Potential confounding factors, such as age, sex, and nutritional status, were acknowledged and considered during data interpretation.

Research Location and Time

The research was conducted at the Department of Statistics, Faculty of Mathematics and Natural Sciences, Syiah Kuala University, Banda Aceh, Indonesia. Data collection was conducted from November to December 2024, coinciding with the active period of thesis writing for final-year students.

Sample, Sample Size, and Sampling Technique

The research population consisted of all 2021 Statistics Department students at the Faculty of Mathematics and Natural Sciences, Syiah Kuala University, who were writing their theses during the research period. The study population consisted of all 2021 cohort students in the Department of Statistics who were actively writing their theses during the study period. The total population was 50 students, all of whom were included as respondents using a total sampling technique. Given the limited population size, no formal sample size calculation was performed, and the study was intended to provide a complete representation of the accessible population rather than achieve statistical generalization. Consequently, the external validity of these findings may be limited.

The sampling technique used was total sampling, where all members of the population who met the inclusion criteria were included as respondents. This technique was chosen to minimize selection bias and provide a complete picture of the target population of the study.

The inclusion criteria were active undergraduate students who were currently in the thesis-writing phase and were willing to participate. Exclusion criteria included incomplete questionnaire responses and withdrawal during data collection

Data Collection Procedures and Processing Techniques

Academic stress was measured using the Educational Stress Scale for Adolescents (ESSA) developed by Moustaka et al. (2023). Although originally designed for adolescents, this instrument has been widely applied in late adolescent and university student populations in previous studies, supporting its use in this study. Emotional eating was measured using the Emotional Eater Questionnaire (EEQ) developed by Bernabéu et al. (2020). Both instruments were translated into Indonesian using a forward-backward translation procedure. Prior to data collection, a pilot test was conducted with a small group of students to ensure clarity and cultural relevance. Internal consistency reliability in this study showed acceptable values (Cronbach's alpha: ESSA = 0.87; EEQ = 0.85)

Data were collected using a self-administered, structured questionnaire distributed offline during scheduled academic sessions. The use of self-reported data may introduce potential biases, including recall and social desirability biases. To minimize these risks, respondents were assured of anonymity and confidentiality, and standardized instructions were provided before completing the questionnaire.

Academic stress variables were measured using the *Educational Stress Scale for Adolescents* (ESSA) developed by Moustaka et al. (2023). This instrument consists of 16 questions covering the dimensions of learning pressure, academic burden, concerns about achievement, self-expectations, and academic despair. Each item was rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The total scores were classified as mild stress (<37), moderate stress (37–59), or severe stress (≥60).

The emotional eating variable was measured using the *Emotional Eater Questionnaire* (EEQ) developed by Bernabéu et al. (2020), which consists of ten questions with a 4-point Likert scale (0 = never to 3 = always). The total EEQ score was categorized as follows: no emotional eating (≤5), mild emotional eating (6–10), moderate emotional eating (11–20), and severe emotional eating (≥21). All instruments were translated into Indonesian and used as per the original guidelines.

The collected data underwent completeness checks (editing), coding, and data entry into the statistical software. The total scores for each instrument were calculated according to the measurement instructions and then categorized for descriptive analyses.

Analysis Model and Statistical Tests

Data analysis was performed using univariate and bivariate methods. Univariate analysis was used to describe the respondent characteristics and variable distributions. Prior to the bivariate analysis, data normality was assessed using the Shapiro–Wilk test, which indicated a non-normal distribution.

The relationship between academic stress and emotional eating scores was analyzed using Spearman's rank correlation coefficient (r_s). The 95% confidence interval for the correlation coefficient was estimated using the bootstrap method with 1,000 resamples. Statistical significance was set at $p < 0.05$. Due to the limited sample size, multivariate analysis was not performed; however, potential confounding variables were considered in the interpretation of the results.

Ethical Approval

This study was approved by the Health Research Ethics Committee of the Aceh Ministry of Health Polytechnic (approval number: DP.04.03/12.7/281/2024). All participants provided informed consent prior to the study. Confidentiality and anonymity were strictly maintained in accordance with ethical research principles.

Result and Discussion

Results

This study involved 50 final-year students from the Department of Statistics, Faculty of

Mathematics and Natural Sciences, Syiah Kuala University, who were writing their thesis. The characteristics of the participants are presented in Table 1.

Table 1. Characteristics of research subjects

Characteristics	N	%
Gender		
Male	22	44
Female	28	56
Age group (years)		
21–22	34	68
23–24	14	28.0
≥25	2	4.0
Cumulative Grade Point Average (CGPA)		
<3.00	6	12
3.00–3.49	28	56.0
≥3.50	16	32
Body Mass Index (BMI)		
Underweight (<18.5 kg/m ²)	5	10
Normal (18.5–22.9 kg/m ²)	29	58.0
Overweight (23.0–24.9 kg/m ²)	8	16.0
Obesity (≥25.0 kg/m ²)	8	16

Based on the characteristics of the research subjects (Table 1), the respondents were predominantly young adult students, with the majority aged 21–22 years (68.0%), reflecting the academic transition phase towards completion of studies. The gender composition was relatively balanced, with a slightly higher proportion of females (56.0%), reflecting the

distribution of characteristics within the study sample. Academically, most respondents had a grade point average in the medium (3.00–3.49) to high (≥ 3.50) range, indicating good academic capacity despite being in the stressful phase of writing their thesis. In terms of nutritional status, the majority of respondents were in the normal BMI category (58.0%); however, there was still a significant proportion in the overweight (16.0%) and obese (16.0%) categories. This condition indicates variability in the nutritional status among respondents, which may be relevant to health behaviors, including eating patterns, although this relationship was not specifically analyzed in the present study.

Furthermore, the results of academic stress measurement (Table 2) using the *Educational Stress Scale for Adolescents* (ESSA) showed that most respondents experienced moderate academic stress (80%), followed by severe stress (18%) and mild stress (2%). The average ESSA score was 51.3 ± 8.6 , indicating that respondents often experience academic pressure. The most dominant stress indicators were the feeling of disappointing parents when academic results were unsatisfactory and the perception of an excessive academic workload. Conversely, the pressure from parental attention to academic grades was relatively low. These findings indicate that academic stress in final-year students stems more from internal demands and personal expectations than from external pressures.

Table 2. Academic stress levels and emotional eating among students (n = 50)

Variable	Category	n	%	Min–Max	Mean $\pm$ SD
Academic Stress (ESSA)	Mild	1	2	34–64	51.3 ± 8.6
	Moderate	40	80		
	Severe	9	18		
	ESSA total score				
Emotional Eating (EEQ)	No emotional eating	0	0	11–28	20.9 ± 4.3
	Mild	0	0		
	Moderate	27	54		
	Severe	23	46		
	Total EEQ Score				

Similarly, emotional eating (Table 2) showed that respondents were predominantly classified in the moderate (54%) and severe (46%) categories, with no respondents categorized as non-emotional or mild emotional eating. This distribution suggests a clustering of scores in higher categories, which may reflect a

tendency toward elevated emotional eating in this sample or indicate potential measurement sensitivity or cut-off classification effects. The mean EEQ score was 20.9 ± 4.3 , indicating a relatively high frequency of eating behavior in response to negative emotions in this sample. The most prominent indicators of emotional

eating were the tendency to crave certain foods and to eat when experiencing stress, anger, or boredom. Meanwhile, extreme loss of control

over eating, such as giving up on a diet, was reported less frequently.

Table 3. Correlation between academic stress and emotional eating scores

Variable	r_s (Spearman)	95% CI	p-value
Academic Stress Score vs. Academic Performance Emotional Eating Score	0.33	0.05 – 0.56	0.018

The results of the Spearman's rank correlation test showed a significant relationship between academic stress and emotional eating scores among final-year students ($r_s = 0.33$; $p = 0.018$). A p-value of less than 0.05 indicated that the relationship was statistically significant at a 95% confidence level. The Spearman correlation coefficient of 0.33 indicates a weak-to-moderate positive correlation in a positive direction. This means that the higher the level of academic stress experienced by students, the higher their tendency to engage in emotional eating. The 95% confidence interval (0.05–0.56) that did not cross zero suggests that the observed association was statistically reliable within this sample between the two variables.

These findings suggest that academic stress is associated with increased emotional eating behavior among final-year students; however, this relationship should be interpreted cautiously, given the cross-sectional design and limited sample size.

The predominance of moderate to severe academic stress among final-year students in this study highlights the substantial psychological burden associated with the thesis writing phase. Rather than merely reflecting academic demands, this finding may indicate the cumulative effects of multiple stressors, including time pressure, performance expectations, and uncertainty related to graduation. Similar patterns have been reported in previous studies (Allen et al., 2021; Syarofi & Muniroh, 2020), although the magnitude of stress varies across different academic settings and cultural contexts. The high level of academic stress found in this study can be understood as a response to chronic and recurring stress. Prolonged exposure to academic stress disrupts an individual's psychological and physiological balance (Almarzouki, 2024; Wong Aitken et al., 2024). According to Abadi and Aini(2025), academic stress triggers the activation of the hypothalamic–pituitary–adrenal (HPA) axis,

which increases the secretion of cortisol, a hormone that plays a role in regulating appetite and food preferences.

The high proportion of respondents classified as having moderate to severe emotional eating warrants careful interpretation. While this finding may reflect a tendency toward emotion-driven eating as a coping mechanism under academic stress (Chamberlin et al., 2018; Ramadhani & Mahmudiono, 2021), it may also indicate potential measurement sensitivity or cut-off classification issues within the questionnaire. Previous studies have reported more varied distributions of emotional eating behaviors, suggesting that contextual or methodological factors may influence the observed patterns (Yilmazturk et al., 2023).

The positive correlation between academic stress and emotional eating found in this study is consistent with that of several previous studies (Du et al., 2022; Yilmazturk et al., 2023). However, other studies have reported weaker or non-significant associations after controlling for confounding variables such as sleep quality, sex, and coping strategies, suggesting that the relationship may be influenced by multiple interacting factors. This indicates that academic stress may act as one of several contributing factors rather than a sole determinant of emotional eating behavior

The observed association between academic stress and emotional eating may be explained by biological and psychological mechanisms. From a biological perspective, previous studies have suggested that chronic stress is associated with the activation of the hypothalamic–pituitary–adrenal (HPA) axis and increased cortisol levels, which may influence appetite regulation and preference for energy-dense foods (Chao et al., 2017). However, it should be noted that physiological markers, such as cortisol, were not measured in this study; therefore, this explanation remains theoretical. Psychologically, stress is associated with

reduced self-regulation and increased reliance on food as a short-term emotional coping strategy (Ceylan et al., 2026). (Ceylan et al., 2026). In the context of this study, the positive correlation observed suggests a tendency toward this behavior, although the causal direction cannot be determined. Although emotional eating can provide temporary comfort, it has the potential to cause long-term health effects, such as weight problems, decreased sleep quality, metabolic disorders, and an increased risk of depression (de Oliveira Penaforte et al., 2016; Miyake et al., 2025). These findings suggest the potential relevance of integrating stress management and emotional regulation strategies into student health programs. However, given the modest strength of the association observed, such interventions should be considered part of a broader, multifactorial approach to improving students' well-being and eating behavior.

This study had several limitations. First, the cross-sectional design precludes causal inference and does not allow for the determination of temporal relationships between academic stress and emotional eating. Second, the relatively small sample size and restriction to a single study program limit generalizability of the findings. Third, the use of self-reported questionnaires may have introduced recall and social desirability biases. Additionally, although standardized instruments were used, the ESSA was originally developed for adolescents, which may affect the measurement accuracy when applied to university students. Potential misclassification in emotional eating categories may have occurred, as indicated by the clustering of respondents in higher categories. Furthermore, important confounding variables, such as sleep quality, coping strategies, dietary intake, and social support, were not controlled for in the analysis, which may have influenced the observed relationship.

Conclusion

This study found that academic stress was positively associated with emotional eating behavior among final-year students writing their theses. Students experiencing higher levels of academic stress tended to report greater emotional eating behavior in response to

negative emotions. These findings suggest that academic stress may contribute to variations in eating behavior, although this relationship should be interpreted cautiously, given the study design and sample size.

Targeted promotive and preventive efforts within the university setting may be considered to support students in managing academic stress and related eating behaviors in the future. Potential interventions may include strengthening campus-based counseling services, providing programs on stress management and emotional regulation, and promoting healthy eating behaviors as part of student health initiatives. An integrated approach combining academic and health support services may help address the multiple determinants of student well-being, although further research is needed to evaluate its effectiveness.

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