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THE CORRELATION BETWEEN EMOTIONAL EATING AND STRESS WITH NUTRITIONAL STATUS IN ADOLESCENTS AT SMAN 5 SURABAYA

Hubungan antara Emotional Eating dan Stres dengan Status Gizi pada Remaja di SMAN 5 Surabaya

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ABSTRACT

Adolescents are a vulnerable group for experiencing nutritional issues, including both undernutrition and overnutrition. Eating behaviors, such as emotional eating, and psychological conditions like stress can influence adolescents' nutritional status. This study aims to analyze the correlation between emotional eating and stress with nutritional status in adolescents at SMAN 5 Surabaya. This study employs a cross-sectional design with a quantitative analytical approach. A total of 142 students from grades X and XI were selected as subjects through cluster random sampling. Data were collected using the Salzburg Emotional Eating Scale (SEES) to assess emotional eating, the Perceived Stress Scale (PSS-10) to measure stress levels, and anthropometric measurements to determine nutritional status based on Body Mass Index-for-Age (BMI/A). Spearman's correlation analysis revealed no correlation between emotional eating and nutritional status (p = 0.460; r = -0.063). However, a significant correlation was found between stress and nutritional status (p = 0.013; r = 0.207), indicating that as stress levels increase, nutritional status also tends to increase. In conclusion, this study found that stress is correlated with nutritional status (BMI/A z-score). These findings emphasize the importance of stress management in controlling emotional eating behaviors and maintaining optimal nutritional status among adolescents.

Keywords: adolescents, emotional eating, stress, nutritional status

ABSTRAK

Remaja termasuk dalam kelompok usia yang berisiko mengalami permasalahan gizi, baik gizi kurang maupun gizi lebih. Faktor perilaku makan, seperti *emotional eating*, dan kondisi psikologis, seperti stres, dapat memengaruhi status gizi remaja. Penelitian ini bertujuan untuk menganalisis hubungan antara *emotional eating* dan stres dengan status gizi pada remaja di SMAN 5 Surabaya. Metode penelitian ini menggunakan desain *cross sectional* dengan pendekatan kuantitatif analitik. Sebanyak 142 siswa kelas X dan XI dipilih sebagai subjek penelitian menggunakan *cluster random sampling*. Data dikumpulkan menggunakan kuesioner *Salzburg Emotional Eating Scale* (SEES) untuk *emotional eating, Perceived Stress Scale* (PSS-10) untuk stres, serta pengukuran antropometri untuk status gizi berdasarkan Indeks Massa Tubuh menurut Umur (IMT/U). Hasil korelasi *Spearman* menunjukkan tidak terdapat hubungan antara *emotional eating* dengan status gizi (p = 0,460; r = -0,063). Terdapat hubungan signifikan antara stres dengan status gizi (p = 0,013; r = 0,207), yakni ketika tingkat stres meningkat, status gizi (*z-score* IMT/U) juga cenderung meningkat. Kesimpulan dari penelitian ini adalah stres memiliki hubungan dengan status gizi. Temuan ini diharapkan dapat menjadi acuan akan pentingnya pengelolaan stres dalam mengontrol perilaku makan *emotional eating* dan menjaga status gizi yang optimal.

Kata kunci: remaja, *emotional eating*, stres, status gizi

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INTRODUCTION

Adolescence is a stage of transition from childhood to adulthood, defined by physical development, mental, social, and emotional maturation.[1] This peak developmental phase influences changes in body composition, bone mass formation, knowledge, and weight stability.[2] As a result, adolescents are vulnerable to nutritional problems, including both undernutrition and overnutrition.

According to Survei Kesehatan Indonesia (SKI) 2023, the prevalence of nutritional status based on BMI-for-age (BMI/A) among adolescents aged 13–15 years shows that 7.6 percent were underweight, 76.1 percent were normal, 12.1 percent were overweight, and 4.1 percent were obese. Meanwhile, among those aged 16–18 years, 8.3 percent were underweight, 79.6 percent were normal, 8.8 percent were overweight, and 3.3 percent were obese. In East Java, the prevalence of underweight adolescents aged 13–15 years was 6.7 percent, with 73.5 percent being normal, 15 percent overweight, and 4.8 percent obese. Among those aged 16–18 years, 8.2 percent were underweight, 77 percent were normal, 10.2 percent overweight, and 4.7 percent obese.[3] In Surabaya, the capital city of East Java, 98,334 cases of obesity were recorded in individuals aged ≥15 years old in 2017.[4] Nutritional status serves as an important health indicator for adolescents, helping to prevent various health conditions.

Nutritional status is influenced by various factors, including eating behavior and psychological conditions. Adolescents are at risk of engaging in emotional eating behavior and experiencing stress due to their self-discovery phase and intense emotional fluctuations.[5] Emotional eating refers to food consumption driven by emotions rather than hunger. It is considered an unhealthy eating behavior due to the lack of control over food choices and portion sizes. This is supported by Sumartini (2022), who found that 83.01 percent of adolescents exhibited unhealthy eating behaviors, such as frequent snacking.[6] Foods chosen during emotional eating episodes are often high-fat, sugary snacks and fast food, which contribute to increased body fat accumulation.[7] The selection of these foods is driven by emotional motives, often as a coping mechanism for problems, stress, or pressure.[8]

Stress is a natural psychological response that can also manifest as an emotional disorder. The Riskesdas data (2018) reported that the prevalence of emotional and mental disorders among individuals aged 15–24 years reached 10 percent, an increase from 5.6 percent in 2013.[9] When experiencing stress or pressure, the body signals the adrenal glands to release cortisol, a hormone responsible for regulating metabolism and stress response. Cortisol can either increase or decrease food intake, depending on individual factors.[10]

Adolescents' stress can be caused by both academic and non-academic factors, such as academic pressure and relationships with friends.[11] Stress has been shown to be linked to emotional eating behavior. The higher the emotional eating score, the greater the tendency for individuals to experience an increase in food consumption.[12] SMAN 5 Surabaya is one of the top-ranked high schools in Surabaya, known for its academic excellence.[13] The school has implemented a zoning system, which results in students coming from diverse academic backgrounds.[14] This condition, along with other external pressures such as family expectations, peer competition, and self-perception, may contribute to increased stress levels in adolescents. Additionally, the school's central location provides easy access to food, which may influence emotional eating behaviors. These factors make SMAN 5 Surabaya a relevant setting for this study. Therefore, this study aims to examine the correlation between emotional eating and stress with nutritional status in adolescents at SMAN 5 Surabaya.

METHODS

This study is a quantitative observational analytic study with a cross-sectional design, conducted at SMAN 5 Surabaya from August to September 2024. A total of 142 students from grade X and XI were selected through cluster random sampling as they met the inclusion criteria, including being aged 15–18 years, not currently on a diet, physically and mentally healthy, able to communicate well, and willing to participate by signing informed consent. Initially, 171 students were considered, but 29 were excluded: 6 were absent, 15 had incomplete

data, and 8 were under 15 years old. The minimum required sample size was 88 students, with an additional 10 percent (97 students) to anticipate dropouts. The final sample of 142 students was expected to provide more representative results, as a larger sample size increases the likelihood of capturing population characteristics.[15]

The independent variables in this study were emotional eating and stress levels, while the dependent variable was nutritional status. The Salzburg Emotional Eating Scale (SEES) developed by Meule (2018) was utilized to evaluate emotional eating.[16] This questionnaire consists of 20 items that cover both positive and negative emotions. Each item is rated on a Likert scale ranging from 1 to 5, where 1 = eat much less, 2 = eat less, 3 = eat as usual, 4 = eat more, and 5 = eat much more. Emotional eating scores were calculated by averaging the total score. Emotional eating was categorized as low if the mean score was < 3, moderate if it was = 3, and high if it was > 3. The Salzburg Emotional Eating Scale (SEES) questionnaire has been tested for validity with r-values ranging from 0.267 to 0.730, which are greater than the critical r-value (0.254), and for reliability with Cronbach's Alpha (α = 0.829).[17]

Stress levels were measured using the Perceived Stress Scale (PSS-10), designed by Cohen (1984).[18] This questionnaire consists of 10 items, each rated on a Likert scale as follows: 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, and 4 = very often. Stress scores were categorized as low (0–13), moderate (14-26), and high (27–40).[19] The Perceived Stress Scale (PSS-10) questionnaire has been tested for validity (r=0.429–1) and reliability with Cronbach's Alpha (α = 0.950).[20]

The SEES and PSS-10 questionnaires were distributed via Google Forms, collecting demographic data on age, gender, and grade level, while daily allowance was categorized based on the respondents' average. Nutritional status was measured using direct anthropometric assessment of height and weight by the researcher, using a digital scale for weight measurement and a microtoise for height measurement. The data were analyzed using WHOAnthroPlus® to determine the BMI-for-age (BMI/A) z-score. Nutritional status was categorized as follows: underweight (BMI/A < -2 SD), normal (BMI/A between -2 SD and +1 SD), and overweight (BMI/A > +1 SD).[21]

The gathered data were examined for normality using the Kolmogorov-Smirnov test, while statistical analysis was conducted using the Spearman correlation test with a significance level of $p < 0.05$. This research obtained ethical approval from the Ethics Committee of the Faculty of Dental Medicine, Universitas Airlangga (No. 0811/HRECC.FODM/VIII/2024).

RESULT

The results of this study describe respondent characteristics, variable distributions, and correlation analysis results. The frequency distribution of respondent characteristics includes age, gender, grade level, and average daily allowance, as shown in Table 1.

Based on Table 1, the majority of respondents were 15 years old (49.3%). Most respondents were female (54.9%) and in grade X (62.7%). Regarding average daily allowance, 71.8 percent of respondents had less than IDR 25,000 per day. In terms of emotional eating, the majority of respondents (69.7%) had low emotional eating, with an average score of 2.70 and a standard deviation of 0.53. Most respondents (78.2%) experienced moderate stress, with an average score of 20.57 and a standard deviation of 5.84. Regarding nutritional status, 66.2 percent of respondents had a normal, followed by 31.7 percent who were classified as overweight. The average nutritional status (z-score) value was 0.30, with a standard deviation of 1.31. Table 2 shows that most respondents with low emotional eating had normal nutritional status (63.6%). The Spearman's correlation test results showed a p-value of 0.460 ($p>0.05$), indicating no correlation between emotional eating and nutritional status. The correlation coefficient $r = -0.063$ suggests a very weak negative correlation.

Table 3 indicates that 69.4 percent of respondents with moderate stress had normal nutritional status. The Spearman's test ($p=0.013$; $r=0.207$) reveals a weak positive correlation between stress and nutritional status. Furthermore, 55.6 percent of overweight individuals experienced high stress, supporting the link between higher stress levels and higher nutritional status.

Table 1

Frequency Distribution of Respondent Characteristics (n = 142)

Variables	Labels	n	%	Mean±SD
Ages	15 years old	70	49.3	15.60 ± 0.65
	16 years old	59	41.5	
	17 years old	13	9.2	
Gender	Male	64	45.1	
	Female	78	54.9	
Grade Level	X	89	62.7	
	XI	53	37.3	
Average Daily Allowance (IDR)	<IDR 25,000	102	71.8	25,098.59 ± 19,485.33
	≥IDR 25,000	40	28.2	
Emotional Eating	Low	99	69.7	2.70 ± 0.53
	Moderate	14	9.9	
	High	29	20.4	
Stress	Low	13	9.2	20.57 ± 5.84
	Moderate	111	78.2	
	High	18	12.7	
Nutritional Status	Underweight	3	2.1	0.30 ± 1.31
	Normal	94	66.2	
	Overweight	45	31.7	

Table 2

Correlation between Emotional Eating and Nutritional Status (n = 142)

Emotional Eating	Nutritional Status						Total		r	p-value
	Underweight		Normal		Overweight					
	n	%	n	%	n	%	n	%		
Low	2	2	63	63.6	34	34.3	99	100	-0.063	0.460
Moderate	1	7.1	10	71.4	3	21.4	14	100		
High	0	0	21	72.4	8	27.6	29	100		
Total	3	2.1	94	66.2	45	31.7	142	100		

Table 3

Correlation between Stress and Nutritional Status (n = 142)

Stress	Nutritional Status						Total		r	p-value
	Underweight		Normal		Overweight					
	n	%	n	%	n	%	n	%		
Low	1	7.7	9	69.2	3	23.1	13	100	0.207	0.013
Moderate	2	1.8	77	69.4	32	28.8	111	100		
High	0	0	8	44.4	10	55.6	18	100		
Total	3	2.1	94	66.2	45	31.7	142	100		

DISCUSSION

Emotional Eating and Nutritional Status

In this study, emotional eating is defined as eating behavior driven by emotions that affect appetite and food intake. This study found that the majority of respondents exhibited low levels of emotional eating (69%), followed by high (20.4%) and moderate levels (9.9%). These findings align with previous studies, which reported that most adolescents experience emotional undereating (54.3%), while others engage in emotional overeating (14.3%) or maintain normal eating patterns (31.4%).[22]

This study found no relationship between emotional eating and nutritional status among adolescents at SMAN 5 Surabaya. This lack of significance may be due to the characteristics of the respondents, most of whom were aged 15–16 years. This age group is in the middle adolescence stage, characterized by self-love and a strong need for peer relationships.[23] This suggests that when adolescents experience strong emotions, whether positive or negative, their emotional eating behavior depends greatly on themselves and their environment.

Additionally, the majority of respondents were female. Female adolescents tend to have a negative body image or dissatisfaction with their bodies.[24] Although emotional eating occurs in response to certain emotions, adolescents with a negative body image may regulate their eating behavior to maintain or achieve an ideal body shape.[25] Another influencing factor is daily allowance, where most respondents had an allowance of <IDR 25,000 compared to ≥IDR 25,000. Allowance impacts food choices, with a higher allowance providing greater access to a variety of foods.[26] However, allowances are not always fully spent on food and drinks but may also be used for school supplies or savings.[27] These factors may explain why emotional eating does not significantly affect nutritional status in this study.

This study contrasts with the study that reported a significant relationship between emotional eating and nutritional status among adolescents at SMAS Muhammadiyah 02 Medan ($p < 0.001$).[28] In that study, overweight and obese students tended to have high emotional eating levels. The study involved 110 respondents and used the Dutch Eating Behaviour Questionnaire (DEBQ) as a measurement tool. Conversely, this study aligns with another research which found no significant association between emotional eating and nutritional status among adolescents at SMA 2 Cileungsi Bogor ($p = 0.647$).[29] That study suggested that emotional eating is not the sole factor affecting nutritional status, as inadequate nutrient consumption and infectious diseases are the primary contributors to nutritional issues, which were not measured in this study. Similarly, research at SMA Negeri 22 Bandung also found no significant relationship between emotional eating and nutritional status ($p = 0.166$, $r = 0.081$).[30] A possible explanation for these findings is the presence of other dominant eating behaviors, such as restrained eating and external eating. Restrained eating involves restricting food intake to lose weight, which may lead to irregular eating patterns and weight gain. External eating is triggered by external factors (e.g., visual cues, smell, or taste) rather than physical hunger, making individuals more likely to eat even when not hungry.

The measurement tool used in this study, the Salzburg Emotional Eating Scale (SEES), differs from previous studies. This tool assesses emotional eating driven by both positive and negative emotions. Generally, emotional eating refers to the tendency to overeat in response to negative emotions.[31] However, positive emotions can also increase food intake.[32] Thus, this tool provides a broader understanding of the emotions associated with food consumption. Although emotional eating theoretically affects nutritional status, it is not the only contributing factor. Nutritional status is influenced by multiple factors, including food intake and physical activity levels.[33] Moreover, eating behaviors are shaped by parental upbringing, psychological processes (e.g., emotions and personality), cognitive processes (e.g., thinking patterns and knowledge), and physiological factors (e.g., hunger and satiety).[34,35]

Stress and Nutritional Status

In this study, stress is defined as a change in physical or psychological conditions perceived as a threat or pressure. Based on the study results, most respondents experienced moderate stress levels (111 respondents, 78.2%), followed by high stress levels (18 respondents, 12.7%)

and low stress levels (13 respondents, 9.2%). These findings align with Kurniawaty & Purnama (2023), who reported that 78.4 percent of respondents had moderate stress levels.[36]

The study also found a significant correlation between stress and nutritional status among adolescents at SMAN 5 Surabaya. This finding is supported by Aulianti & Puspitasari (2021), who found a significant correlation between stress levels and nutritional status (p = 0.000) among 211 high school students using the Depression Anxiety Stress Scale (DASS).[37] That study reported that stress-induced behavioral changes, such as overeating, reduced physical activity, and insufficient sleep, could impact nutritional status. However, this result contradicts with the study that found no significant association between stress and nutritional status among students at SMA Negeri 1 Kalasan, Yogyakarta (p = 0.627).[38] This discrepancy may be due to the school's active extracurricular programs, which help students manage stress and maintain a balanced nutritional status.

Stress in adolescents stems from academic and non-academic stressors. Academic stressors include study pressure and performance expectations, while non-academic stressors include romantic relationships and peer competition.[11,39] According to Andreasen & Black, stress can originate from the environment, thoughts, and self perception.[40] Environmental factors include living conditions, lack of parental support, and ineffective parenting styles.[41] Thoughts and self-perception can also be sources of stress as part of an adolescent's developmental tasks. Success in meeting these challenges leads to happiness, while failure results in distress and difficulties.[42]

This study also found a correlation coefficient (r) of 0.207, between stress and nutritional status indicating a weak positive correlation. This means that as stress levels increase, nutritional status also tends to increase, though the correlation is not particularly strong. The cross-tabulation shows that most students with moderate stress levels also have a good nutritional status, totaling 77 respondents (69.4%). These findings are consistent with the study by Adinata (2022) which found a significant association between stress levels and the nutritional status of tenth-grade students at SMK Kesehatan KH Moch Ilyas Ruhiyat, with a p-value of 0.037.[43] The correlation coefficient in that study was 0.274 (weak positive), and it was found that most students experienced mild stress while maintaining a good nutritional status (17 respondents, 85%).

Despite experiencing stress, the majority of respondents in this study maintained a normal nutritional status. This may be attributed to school programs, such as extracurricular activities and counseling services, which help students manage stress through sports, arts, and social interactions.[44,45] Moreover, a supportive school environment with adequate facilities and responsive teachers creates a conducive learning atmosphere, preventing stress from negatively affecting nutritional status.[46]

Stress affects nutritional status through several mechanisms. It can trigger anorexigenic effects (decreasing appetite) or orexigenic effects (increasing appetite), depending on the nature and duration of the stress.[10] According to Tomiyama (2019), stress disrupts cognitive processes, including executive functions, such as problem-solving and impulse control, making it difficult for individuals to make healthier food choices. Stress can also lead to overeating and increased consumption of calorie-dense, fatty, or sugary foods, while simultaneously reducing physical activity and sleep duration. Additionally, stress triggers physiological changes in the hypothalamic-pituitary-adrenal (HPA) axis, leading to the release of cortisol. Increased cortisol levels in the bloodstream activate fat storage enzymes, resulting in visceral fat accumulation.[47] Moreover, stress can disrupt dopamine release, a neurotransmitter that enhances food cravings and contributes to obesity.[48]

This study has several strengths, including the use of validated instruments (SEES and PSS-10), an adequate sample size that enhances result representativeness, and appropriate statistical analysis (Spearman correlation test) to assess variable relationships. However, its limitations include the cross-sectional design, which only identifies correlations rather than causal relationships, potential response bias due to self-reported data via Google Forms, and the study's restriction to a single school, limiting generalizability. Additionally, other factors influencing nutritional status, such as physical activity and dietary intake, were not extensively analyzed.

CONCLUSION

The findings of this study indicate that there is no correlation between emotional eating and nutritional status. However, a significant relationship was identified between stress and nutritional status among adolescents at SMAN 5 Surabaya. As stress levels increase, individuals are more likely to have overweight or obesity.

RECOMMENDATION

This study highlights the importance of stress management and maintaining optimal nutritional status among adolescents. Educational institutions are encouraged to implement stress management initiatives, such as peer-based counseling services and nutrition education programs, to support students' well-being. Future research should explore additional factors influencing nutritional status, including other eating behaviors, sleep patterns, physical activity, and dietary intake, to provide a more comprehensive understanding. To enhance the accuracy and depth of the findings, future studies are recommended to expand the study population, include more diverse research locations, and adopt more advanced research designs, such as experimental studies.

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