

## CORRELATION OF EMOTIONAL EATING AND NUTRITIONAL STATUS AMONG ADOLESCENTS IN SURABAYA

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### ABSTRACT

*Adolescence is an important period of growth because the growth spurt which occurs is the peak of physical and emotional growth and development. Adolescents often experience stress in learning at school so they need good stress coping mechanisms. One coping mechanism that is often used is to apply emotional eating. This study aims to examine the correlation between emotional eating and the nutritional status of students at SMAN 5 Surabaya. A cross-sectional method was applied involving 91 students. Nutritional status was assessed using BMI-for-age Z-scores according to WHO Anthro Plus standards, while emotional eating was evaluated through the Eating Evaluation due to Emotions and Stress (EADES) questionnaire. The findings showed that 35.2% of students were classified as overweight, and 16.5% as obese. Additionally, 71.4% of the participants reported experiencing emotional eating. A significant association was found between emotional eating and excessive nutritional status ( $p=0.010$ ). It can be concluded that emotional eating directs teenage students to a nutritional status that tends to be higher; this will have an impact on the growth and development adolescents physically and emotionally. Students are expected to have better stress coping so they don't experience emotional eating.*

**Keywords:** emotional eating, nutritional status, adolescents, overweight, stress

### INTRODUCTION

Adolescence represents a critical phase in a child's developmental trajectory, characterized by a significant acceleration in physical growth, culminating in the peak of height attainment. Growth spurts in children are usually marked by the start of puberty where there will be hormonal changes, reproductive function, changes in body shape, and the appearance of signs of secondary growth such as hair growth in several parts of the body and changes in body composition (Health et al., 2012). During adolescence, people often experience emotional maturation, so adolescents often want to explore their eating habits, which can have an impact on the adolescents' nutritional intake and nutritional status (Prentice et al., 2013).

Peer influence can cause adolescents to have a tendency to determine things, including adolescents' daily eating patterns. This is closely related to the emotional development of

adolescents who are still unstable so it is very easy to follow the current trends that occur in peer interactions (Rachmi et al., 2021). Apart from that, adolescents at school experience many events that trigger stress, such as high study loads, subject exams, relationships with peers and teachers at school, even a negative body image can also increase stress (Cash, 2004; Fisher et al., 2002; Kong & Harris, 2015). Adolescent stress must be managed through effective coping strategies to prevent excessive accumulation, which could negatively impact their growth and developmental processes (Kusuma et al., 2010).

One of the coping mechanisms that most often occur in children is emotional eating. Emotional eating is a form of stress channeling that focuses on changes in eating patterns due to emotional anomalies that occur which can reduce or increase appetite and desire to eat (Geliebter & Aversa, 2003). The higher the incidence of emotional

eating in children, the more it can cause changes in overall eating patterns (de Pinho et al., 2019). Long-term alterations in dietary habits are certain to impact the nutritional status of adolescents. Changes in nutritional status in adolescents can have a big impact because they can hinder the growth and development of adolescents during the growth spurt (Rachmawati et al., 2019). Currently, there is a lack of sufficient evidence regarding the association between emotional eating and nutritional status among Indonesian adolescents. This gap in knowledge serves as the foundation for conducting this study, which aims to examine the relationship between emotional eating and the nutritional status of teenage students at SMAN 5 Surabaya.

## METHODS

This study employed an observational approach utilizing a cross-sectional research design. It was conducted at SMAN 5 Surabaya in May 2023 and received ethical approval from the Health Research Ethics Commission, Faculty of Dentistry, Airlangga University, under certificate number 483/HRECC.FODM/V/2023. The total population is 637 people who were students in classes X and XI. Sampling was carried out using a simple random sampling system using lottery method with a total of 91 subjects as respondents. The variables studied were emotional eating and nutritional status in adolescents.

Calculation of nutritional status is done by calculating BMI/A and plotting the WHO graph using WHO Antro Plus software. Height was measured using a GEA microtoise with a precision of 0.1 cm, while body weight was recorded using a GEA digital scale with an accuracy of 0.1 kg. Body Mass Index-for-Age (BMI/A) was calculated using WHO Anthro Plus software and categorized based on Z-scores in accordance with the Indonesian Ministry of Health Regulation No. 2 of 2020 concerning Child Anthropometric Standards. According to the BMI/A classification, students were grouped as follows: a Z-score below -3 SD indicates severe undernutrition, -3 SD to <-2 SD signifies undernutrition, -2 SD to +1 SD reflects normal nutritional status, and a Z-score above +1 SD indicates obesity.

Emotional eating behavior was assessed using the Eating Evaluation due to Emotions and Stress (EADES) questionnaire, which comprises 24 items. Emotional eating scale is structured based on the Likert scale with five alternative answers consisting of 1 = very disagree, 2 = disagreed, 3 = normal, 4 = agree and 5 = very agree. Furthermore, the final result of the calculation will result in emotional eating behavior values related to diet during stress and have a score range of 24-120. The results indicated that individuals with lower scores are more prone to overeating when experiencing depression or emotional distress. The results were categorized into emotional eating (score <72.6) and non-emotional eating (score ≥72.6) (Ozier et al., 2007).

Statistical analysis was performed using SPSS version 21, employing the Pearson correlation test. The interpretation of results was based on the obtained correlation coefficient (r value). The r value is the contingency coefficient value which shows how close the relationship is between the two variables.

## RESULTS AND DISCUSSIONS

According to the findings presented in Table 1, 62.6% of the participants were female, and 67.0% were aged between 15 and 16 years. If we look at the BMI/A Z-score, it is known that 40.7% of students are still in the normal BMI range, while 35.2% have entered the overweight category, and 16.5% have entered the obese category.

**Table 1.** Characteristic of Respondents

Characteristic of Respondents	n	%
<b>Gender</b>		
Male	34	37.4
Female	57	62.6
<b>Age (year)</b>		
15-16	61	67.0
17 -18	30	33.0
<b>BMI-for-Age Z-Score</b>		
Severely underweight (<-3 SD)	1	1.1
Underweight (-3 SD sd <-2 SD)	6	6.6
Normal (-2 SD sd +1 SD)	37	40.7
Overweight (+1 SD sd +2 SD)	32	35.2
Obese (>+2 SD)	15	16.5
<b>Emotional Eating</b>		
Yes	65	71.4
No	26	28.6

**Table 2.** Distribution of Respondents' Answers Based on the EADES Questionnaire for Adolescents at SMAN 5 Surabaya

No.	Questions	Totally Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Totally Agree (%)
1	I relied on food to cope with my feelings.	13.2	27.5	28.6	14.3	16.5
2	I tend to eat when I feel disappointed in myself.	18.7	35.2	24.2	17.6	4.4
3	I consume food when I'm feeling anxious.	20.9	39.6	27.5	8.8	3.3
4	I think I'm capable of managing my eating habits even when I'm self-upset.	5.5	24.2	25.3	34.1	11
5	I feel confident in regulating my eating behavior during emotional distress.	6.6	23.1	25.3	33	12.1
6	I comfort myself by eating.	11.0	29.7	30.8	20.9	7.7
7	I tend to eat in response to frustration.	20.9	41.8	22	9.9	5.5
8	I eat whenever I'm feeling down or sad.	16.5	40.7	18.7	19.8	4.4
9	I think I can manage my eating behavior when I'm feeling frustrated.	4.4	28.6	29.7	25.3	12.1
10	I turn to food when I'm angry.	22	42.9	20.9	9.9	4.4
11	I believe I can control my eating when I'm feeling sad.	5.5	18.7	35.2	27.5	13.2
12	I tend to eat excessively when under stress.	20.9	34.1	19.8	15.4	9.9
13	I feel I can manage my food intake even when anxious.	5.5	23.1	31.9	29.7	9.9
14	I'm confident I can keep my eating in check when I'm angry.	6.6	25.3	30.8	26.4	11.0
15	I believe I can adapt my eating habits when I'm fatigued.	8.8	26.4	25.3	27.5	12.1
16	I find it difficult to regulate my eating once I start.	26.4	44	18.7	8.8	2.2
17	I usually eat when I'm feeling exhausted.	9.9	20.9	35.2	28.6	5.5
18	I struggle to stop eating even after I'm satisfied.	35.2	41.8	18.7	3.3	1.1
19	I use eating as a way to escape dealing with issues.	28.6	46.2	23.1	1.1	1.1
20	I have difficulty managing the amount of food I eat.	24.2	42.9	19.8	12.1	1.1
21	I'm able to manage my eating habits when I'm feeling at ease.	2.2	12.1	31.9	38.5	15.4
22	I tend to overindulge in food when I'm in social settings.	24.2	37.4	22	13.2	3.3
23	I often eat when I experience a sense of relief.	6.6	14.3	37.4	33	8.8
24	I think I'm capable of maintaining control over my eating when I'm happy.	1.1	4.4	19.8	49.5	25.3

Surprisingly, from the assessment results, it was discovered that 71.4% of students had experienced emotional eating.

An analysis of the EADES results in relation to nutritional status reveals that students who engage in emotional eating tend to fall within the normal to overweight or obese categories. This relationship is supported by a p-value of 0.010 ( $p < 0.05$ ), indicating a statistically significant association between emotional eating and nutritional status.

The results of this study indicate that the majority of respondents who experience emotional eating are included into the excess nutritional status category, while some other respondents are included into the normal category. According to psychosomatic theory, emotional eating can be a coping mechanism for dealing with stress and negative emotions (Geliebter & Aversa, 2003; Rachmawati et al., 2019; Snoek et al., 2013). Emotional eating can occur when someone eats not to satisfy hunger but to cope with stress or

**Table 3.** The Association of Fad Diets, Body Image, and Emotional Eating with Nutritional Status (BMI-for-Age) Among Adolescents at SMAN 5 Surabaya

Variables	Nutritional Status								p-value	r value
	Underweight		Normal		Overweight		Total			
	n	%	n	%	n	%	n	%		
Emotional Eating										
Yes	7	9.6	29	39.7	37	50.7	73	100	0.010	0.268
No	0	0	8	44.4	10	55.6	18	100		

negative emotions they are experiencing (Harriger & Thompson, 2012; Snoek et al., 2013; Yamamoto et al., 2021). Adolescents who experience emotional eating tend to feel excessive hunger and have an increased frequency of consuming high-energy sweet snacks, such as cakes, ice cream, chocolate, and soda (Barnes et al., 2015; Collins, 2011; Tahreem et al., 2022). Some studies suggest that increased snacking frequency can lead to weight gain (Barnes et al., 2015; Bucchianeri et al., 2013; Muinga et al., 2024; Nurjannah & Muniroh, 2019; Rachmawati et al., 2019).

Based on the Pearson correlation analysis, a *p-value* of 0.010 was obtained, indicating a relationship between emotional eating and nutritional status (BMI-for-age). This means that the higher the emotional eating score, the higher the tendency toward the prevalence of excess nutritional status, including both overweight and obesity. As many as 20.9% of respondents use food as a coping mechanism to calm themselves, and 28.6% of respondents consume food when they feel tired. This indicates that when adolescents experience negative emotions or are in suboptimal physical conditions, they tend to resort to emotional eating coping mechanisms (Desa et al., 2023; Madison Yuhasnara & Muslihah, 2024; Wulandari, 2014). Emotional eating with overeating can be caused by two factors: overeating due to inability to distinguish between hunger, fullness, and negative feelings, or a tendency to overeat to reduce perceived emotional pressure (Bonnet et al., 2020; Finkler et al., 2012; Geliebter & Aversa, 2003; Preti et al., 2008). In this case, some respondents experience emotional eating incidents involving overeating, which can serve as a diversion from stress or academic burdens.

Kim et al. (2013) explain that adolescents tend to consume high-energy, sugary, salty, and fatty foods to alleviate discomfort or perceived stress. Therefore, uncontrolled eating behavior during emotional eating can lead to weight gain and nutritional status as a result of consumed calorie surplus. This is consistent with the study by Rachmawati et al., (2019), which shows that incidents of emotional eating and snacking habits among adolescents are higher in the group with excess nutritional status compared to the underweight and normal nutritional status groups. Similar findings are also described by Preti et al. (2008), which reveals a relationship between emotional eating behavior and adolescent nutritional status.

## CONCLUSION

A significant relationship was found between emotional eating and the nutritional status of students at SMAN 5 Surabaya. It is advised that students adopt healthy stress management strategies to prevent harmful emotional eating habits and gain a proper understanding of balanced nutrition to avoid inappropriate dieting practices.

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## REFERENCES

- Barnes, T. L., French, S. A., Harnack, L. J., Mitchell, N. R., & Wolfson, J. (2015). Snacking



- Behaviors, Diet Quality, and Body Mass Index in a Community Sample of Working Adults. *Journal of the Academy of Nutrition and Dietetics*, 115(7), 1117–1123. <https://doi.org/10.1016/j.jand.2015.01.009>
- Bonnet, J. P., Cardel, M. I., Cellini, J., Hu, F. B., & Guasch-Ferré, M. (2020). Breakfast Skipping, Body Composition, and Cardiometabolic Risk: A Systematic Review and Meta-Analysis of Randomized Trials. *Obesity*, 28(6), 1098–1109. <https://doi.org/10.1002/oby.22791>
- Bucchianeri, M. M., Arikian, A. J., Hannan, P. J., Eisenberg, M. E., & Neumark-Sztainer, D. (2013). Body dissatisfaction from adolescence to young adulthood: Findings from a 10-year longitudinal study. *Body Image*, 10(1), 1–7. <https://doi.org/10.1016/j.bodyim.2012.09.001>
- Cash, T. F. (2004). Body image: Past, present, and future. In *Body Image* (Vol. 1, Issue 1, pp. 1–5). [https://doi.org/10.1016/S1740-1445\(03\)00011-1](https://doi.org/10.1016/S1740-1445(03)00011-1)
- Collins, C. E. (2011). Dietary Strategies for Successful Weight Loss and Maintenance: More Evidence Required. *Journal of the American Dietetic Association*, 111(12), 1822–1825. <https://doi.org/10.1016/j.jada.2011.09.016>
- de Pinho, L., Brito, M. F. S. F., Silva, R. R. V., Messias, R. B., e Silva, C. S. de O., Barbosa, D. A., & Caldeira, A. P. (2019). Perception of body image and nutritional status in adolescents of public schools. *Revista Brasileira de Enfermagem*, 72, 229–235. <https://doi.org/10.1590/0034-7167-2018-0644>
- Desa, D. I., Sikep, K., Ambarwati, M. D., Soeyono, R. D., Astuti, N., & Romadhoni, I. F. (2023). Hubungan Aktivitas Fisik dan Perilaku Makan terhadap Status Gizi Remaja Selama Pandemi COVID-19. *Jurnal Tata Boga*, 12(1). <https://ejournal.unesa.ac.id/index.php/jurnal-tata-boga/>
- Finkler, E., Heymsfield, S. B., & St-Onge, M. P. (2012). Rate of weight loss can be predicted by patient characteristics and intervention strategies. *Journal of the Academy of Nutrition and Dietetics*, 112(1), 75–80. <https://doi.org/10.1016/j.jada.2011.08.034>
- Fisher, E., Dunn, M., & Thompson, J. K. (2002). Social comparison and body image: An investigation of body comparison processes using multidimensional scaling. *Journal of Social and Clinical Psychology*, 21(5), 566–579. <https://doi.org/10.1521/jscp.21.5.566.22618>
- Geliebter, A., & Aversa, A. (2003). Emotional Eating in Overweight, Normal Weight, and Underweight Individuals. *Eating Behaviors*, 3, 341–347.
- Harriger, J. A., & Thompson, J. K. (2012). Psychological consequences of obesity: Weight bias and body image in overweight and obese youth. In *International Review of Psychiatry* (Vol. 24, Issue 3, pp. 247–253). <https://doi.org/10.3109/09540261.2012.678817>
- Health, A., Sawyer, S. M., Afi, R. A., Bearinger, L. H., Blakemore, S.-J., Dick, B., Ezech, A. C., & Patton, G. C. (2012). Series Adolescence: a foundation for future health. *Lancet*, 379, 1630–1670. [https://doi.org/10.1016/S0140-6736\(12\)60589-9](https://doi.org/10.1016/S0140-6736(12)60589-9)
- Kim, Y., Yang, H. Y., Kim, A. J., & Lim, Y. (2013). Academic stress levels were positively associated with sweet food consumption among Korean high-school students. *Nutrition*, 29(1), 213–218. <https://doi.org/10.1016/j.nut.2012.08.005>
- Kong, P., & Harris, L. M. (2015). The sporting body: Body image and eating disorder symptomatology among female athletes from leanness focused and nonleanness focused sports. *Journal of Psychology: Interdisciplinary and Applied*, 149(2), 141–160. <https://doi.org/10.1080/00223980.2013.846291>
- Kusuma, M., Wirasto, R., & Huriyati, E. (2010). Status Stres Psikososial dan Hubungannya dengan Status Gizi Siswa SMP Stella Duce 1 Yogyakarta. *Jurnal Gizi Klinik Indonesia*, 6(3), 138–144.
- Madison Yuhasnara, S., & Muslihah, N. (2024). Tingkat Stres Akademik pada Risiko Eating Disorder pada Mahasiswa Gizi Tingkat Akhir Universitas Brawijaya : a Crossectional Study. *Journal of Nutrition College*, 13(2), 188–195. <http://ejournal3.undip.ac.id/index.php/jnc/>
- Muinga, E. N., Waudu, J., & Osur, J. O. (2024). Relationship between intake of energy-dense diets and nutritional status of adolescents in primary schools in Nairobi City County, Kenya. *North African Journal of Food and Nutrition Research*, 8(17), 52–65. <https://doi.org/10.51745/najfnr.8.17.52-65>
- Nurjannah, I., & Muniroh, L. (2019). Body Image, Nutritional Adequacy Level, and Fad Diets among Female Adolescent Models in Surabaya. *Media Gizi Indonesia*, 14(1), 95–105. <https://doi.org/10.204736/mgi.v14i1.95-105>

- Ozier, A. D., Kendrick, O. W., Knol, L. L., Leeper, J. D., Perko, M., & Burnham, J. (2007). The Eating and Appraisal Due to Emotions and Stress (EADES) Questionnaire: Development and Validation. *Journal of the American Dietetic Association*, 107(4), 619–628. <https://doi.org/10.1016/j.jada.2007.01.004>
- Prentice, A. M., Ward, K. A., Goldberg, G. R., Jarjou, L. M., Moore, S. E., Fulford, A. J., & Prentice, A. (2013). Critical windows for nutritional interventions against stunting. In *American Journal of Clinical Nutrition* (Vol. 97, Issue 5, pp. 911–918). <https://doi.org/10.3945/ajcn.112.052332>
- Preti, A., Usai, A., Miotto, P., Petretto, D. R., & Masala, C. (2008). Eating disorders among professional fashion models. *Psychiatry Research*, 159(1–2), 86–94. <https://doi.org/10.1016/j.psychres.2005.07.040>
- Rachmawati, Y., Anantanyu, S., & Kusnandar. (2019). Emotional eating, snacking behavior and nutritional status among adolescents. *International Journal of Public Health Science*, 8(4), 413–418. <https://doi.org/10.11591/ijphs.v8i4.20398>
- Rachmi, C. N., Jusril, H., Ariawan, I., Beal, T., & Sutrisna, A. (2021). Eating behaviour of Indonesian adolescents: a systematic review of the literature. In *Public Health Nutrition* (Vol. 24, pp. S84–S97). Cambridge University Press. <https://doi.org/10.1017/S1368980020002876>
- Snoek, H. M., Engels, R. C. M. E., van Strien, T., & Otten, R. (2013). Emotional, external and restrained eating behaviour and BMI trajectories in adolescence. *Appetite*, 67, 81–87. <https://doi.org/10.1016/j.appet.2013.03.014>
- Tahreem, A., Rakha, A., Rabail, R., Nazir, A., Socol, C. T., Maerescu, C. M., & Aadil, R. M. (2022). Fad Diets: Facts and Fiction. In *Frontiers in Nutrition* (Vol. 9). Frontiers Media S.A. <https://doi.org/10.3389/fnut.2022.960922>
- Wulandari, A. (2014). Karakteristik Pertumbuhan Perkembangan Remaja dan Implikasinya terhadap Masalah Kesehatan dan Keperawatannya. *Jurnal Keperawatan Anak*, 2(1), 39–43.
- Yamamoto, R., Tomi, R., Shinzawa, M., Yoshimura, R., Ozaki, S., Nakanishi, K., Ide, S., Nagatomo, I., Nishida, M., Yamauchi-Takahara, K., Kudo, T., & Moriyama, T. (2021). Associations of skipping breakfast, lunch, and dinner with weight gain and overweight/obesity in university students: A retrospective cohort study. *Nutrients*, 13(1), 1–14. <https://doi.org/10.3390/nu13010271>