

Correlation of Stress Level, Nutrient Intake, and Emotional Eating Behavior with Nutritional Status among High School Students

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ABSTRACT

The aim of the study was to determine the correlation between stress level, nutrient intake and eating behavior with nutritional status among 92 high school students aged 16 to 18 years from the Public High School (SMAN) 1 Kalianda. The Educational Stress Scale for Adolescents (ESSA), Dutch Eating Behavior Questionnaire (DEBQ), and anthropometric measurements were used for data collection. The results showed that the most likely factor to trigger stress was related to the study workload. About 44.6% of the subjects were found to be an emotional eaters. There was significant correlation of stress level, energy, protein, and carbohydrate intake with nutritional status ($p < 0.05$). Based on the result, stress was an important factor that can influence the nutritional status.

Keywords: emotional eating, nutrition intake, nutritional status, stress

INTRODUCTION

The COVID-19 pandemic caused students to adapt to their learning activities in school. The decreasing cases of COVID-19 caused students to re-adapt to the new normal learning activities. A low self-adaptation process can trigger the occurrence of academic stress in students during the new normal era (Siregar 2022). Stress can be triggered by the pressure of demands in school, resulting in physical, cognitive, emotional, and behavioral responses. Stress can also trigger a change in eating behavior, leading to increased or decreased food consumption. Eating as a way of coping with stress is called emotional eating. People with emotional eating tend to eat foods high in fat, sugar, and calories as comfort foods. High consumption of comfort foods will increase energy intake and affect weight gain. The study analyzed the correlation between high school students' stress level, eating behavior, dietary intake, and nutritional status.

METHOD

This cross-sectional research was conducted in Public High School (SMAN) 1 Kalianda, South Lampung from August to September 2022 using purposive sampling

method. A total of 92 participants aged 16 to 18 years had completed the study. The present study was approved by the Research Ethics Committee of the Institute for Research and Community Service (LPPM), IPB University, Indonesia (Ref. No.754/IT3.KEPMSM-IPB/SK/2022).

Data were collected using a variety of assessment methods, including anthropometric measurements, 7-day dietary records, and a validated questionnaire on family and subject characteristics. Stress levels were measured using the Educational Stress Scale for Adolescents (ESSA). The total score of the ESSA ranges from 16-80, with the highest score indicating higher stress (Sun *et al.* 2013). Eating behavior specific to emotional eating is measured using the Dutch Eating Behavior Questionnaire (DEBQ-E). Data analysis was performed using the Microsoft Excel and IBM SPSS 26.

RESULTS AND DISCUSSION

Table 1 shows the mean scores of stress level, eating behavior, nutrient intake, and Body Mass Index-for-age z-score (BAZ). The main factor associated with stress level was study workload, followed by concern about grades, and self expectation. This may be due to too many assignments at school. Stress can also

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(Received 01-06-2023; Revised 27-06-2023; Accepted 06-08-2023; Published 30-12-2023)

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Table 1. General characteristics of stress level, emotional eating status, nutrient intake and body mass index of the participant

Variable	Mean±SD
Stress levels	
Factor 1: Academic pressure (Score range: 0–20)	13.7±0.5
Factor 2: Study workload (Score range: 0–15)	12.6±0.1
Factor 3: Worry about grades (Score range: 0–15)	11.7±0.2
Factor 4: Self-expectations (Score range: 0–15)	10.4±0.2
Factor 5: Despondency (Score range: 0–15)	10.4±0.1
Eating behavior	
Emotional eater	42.05±5.20
Non-emotional eater	25.78±5.52
Energy and nutrient intake	
Energy (kcal)	1,824±270
Protein (g)	50.3±10.1
Fat (g)	65.6±12.2
Carbohydrate (g)	243.7±42.1
Body Mass Index-for-age z-score (BAZ)	-0.09±1.50

change someone's eating habits. The study found that about 44.6% of the subjects experienced emotional eating.

The majority of participants had energy and nutrient intakes below the Recommended Dietary Allowance (RDA). They tended to have irregular eating patterns and liked snacks. Most of them ate snacks during breaks and ate a lot of energy-dense foods (sweet bread and ice cream) and fried foods. The result showed that the average value of BZA was -0.09 ± 1.50 SD, which is classified as normal. Normal nutritional status can be achieved when the intake of nutrients from foods can meet the nutritional needs (Maedy *et al.* 2022).

It is generally agreed that stress levels can significantly alter the dietary intake patterns of an individual, with stress being significantly associated with higher consumption of unhealthy foods, such as foods high in fat, sugar, and sodium, and lower consumption of fruits and vegetables, all of which contribute to the risk of overweight/obesity (Dakanalis *et al.* 2023). In addition, numerous scientific studies have found that high stress is associated with emotional eating. Emotional eating has also

been associated with changes in eating behaviors that lead to increased energy and nutrient intake. Eventually, it can increase the risk of overweight and obesity. The present study found a significant correlation between stress levels and nutritional status ($p < 0.05$). Emotional instability can cause someone to have poor eating behavior (Bitty *et al.* 2018). There is also a significant negative correlation between energy, protein, and carbohydrate intake and BZA ($p < 0.05$).

CONCLUSION

Stress is related to emotional eating and unhealthy dietary patterns, which could trigger increase BAZ. School needs to maintain conducive atmosphere during study to reduce stress that may cause students to become emotional eater. Providing healthy snacks at schools can be a good strategy to keep students' eating habits at school healthy.

ACKNOWLEDGMENT

The authors would like to thank the Public High School (SMA Negeri) 1 Kalianda for the

permission to conduct the research. Appreciation is also given to the teachers and students who have helped and participated in this research.

DECLARATION OF CONFLICT OF INTERESTS

The authors have no conflicts of interest to declare.

REFERENCES

- Bitty F, Asrifuddin A, Nelwan JE. 2018. Stres dengan status gizi remaja di Sekolah Menengah Pertama Negeri 2 Manado. *J KESMAS* 7(5):1–6.
- Dakanalis A, Mentzelou M, Papadopoulou SK, Papandreou D, Spanoudaki M, Vasios GK, Pavlidou E, Mantzorou M, Giaginis C. 2023. The association of emotional eating with overweight/obesity, depression, anxiety/stress, and dietary patterns: A review of the current clinical evidence. *Nutrients* 15(5):1173. <https://doi.org/10.3390/nu15051173>
- Maedy FS, Astika T, Permatasari E. 2022. Hubungan status gizi dan stres terhadap siklus menstruasi remaja putri di Indonesia. *Muhammadiyah J Nutrtrion Food Sci* 3(1):1–10. <https://doi.org/10.24853/mjnf.3.1.1-10>
- Siregar SPA. 2022. Hubungan penyesuaian diri dengan stres akademik dalam menjalani pembelajaran tatap muka terbatas di era new normal pada siswa kelas xi ips SMA Negeri 1 Lubuk Pakam T.A 2021/2022 [Undergraduate Thesis]. Medan: Universitas Negeri Medan.
- Sun J, Dunne MP, Hou X yu, Xu A qiang. 2013. Educational stress among Chinese adolescents: individual, family, school, and peer influences. *Educational Review*. 65(3):284–302. <https://doi.org/10.1080/00131911.2012.659657>