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The Relationship Between Emotional Eating and Weight Gain Problem among Medical Students of Sultan Ageng Tirtayasa University

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ABSTRACT

Emotional eating is a phenomenon of eating behavior triggered by emotions, especially negative emotions such as stress, anxiety, or depression. This behavior is of particular concern in public health due to its contribution to overweight and obesity prevalence across different age groups. In the context of certain populations, such as medical students, weight gain is often influenced by unhealthy lifestyles due to high academic pressure. Stress due to a heavy academic load can trigger unhealthy eating behaviors, one of which is emotional eating, which is the tendency to overeat in response to negative emotions such as stress, anxiety, or sadness. This study is an analytic observational study using a cross-sectional study design and the sampling technique used is simple random sampling with the aim of evaluating the relationship between emotional eating as an independent variable with excessive body weight as the dependent variable, in medical students of the Faculty of Medicine, Sultan Ageng Tirtayasa University. The number of medical students at the Faculty of Medicine and Health Sciences, Sultan Ageng Tirtayasa University, who have the habit of emotional eating is 38 students (50.7%), and the number of students who are excess weight is 28 students (37.3%). Additionally, 16 students (21.30%) have both excess weight and emotional eating habits, while 25 students (33.30%) don't have either excess weight or emotional eating habits. There was an insignificant relationship between the incidence of emotional eating and excessive body weight in medical students of the Faculty of Medicine and Health Sciences, Sultan Ageng Tirtayasa University.

Keywords : emotional eating, weight gain problem, medical students, faculty of medicine

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INTRODUCTION

Emotional eating is a phenomenon of eating behavior triggered by emotions, especially negative emotions such as stress, anxiety, or depression. This behavior is of particular concern in public health due to its contribution to overweight and obesity prevalence in various age groups.⁽¹⁾ The prevalence of emotional eating itself tends to be higher in individuals who experience emotional distress or chronic stress, such as students facing academic burdens or workers with work pressure. A study conducted by Rohmah, 2022 showed that almost 50% of individuals facing severe stressful situations tend to use food as an emotional coping mechanism. This results in a preference for foods high in calories, sugar and fat, which directly affects the increase in Body Mass Index (BMI).⁽²⁾

The problem of overweight and obesity has become one of the significant global health challenges in recent decades. The World Health Organization (WHO) reports that by 2021, more than 39% of the world's adult population will be overweight, with 13% of them categorized as obese.⁽³⁾ The prevalence of overweight and obesity in Indonesia itself has shown a significant increase in the last decade. Data from the Indonesian Ministry of Health shows that the prevalence of obesity in adults increased from 10.5% in 2007 to 21.8% in 2018, with a target of maintaining this figure until the end of 2024. This condition not only increases the risk of chronic diseases, such as type 2 diabetes and cardiovascular disease, but also impacts the mental health and quality of life of individuals.⁽⁴⁾

In the context of certain populations, such as medical students, weight gain is often influenced by unhealthy lifestyles due to high academic pressure. Stress due to a heavy academic load can trigger unhealthy eating behaviors, one of which is emotional eating, which is the tendency to overeat in response to negative emotions such as stress, anxiety, or sadness.⁽⁵⁾ According to Kontinen et al, 2010 Emotional eating can lead to the consumption of foods high in calories, sugar, and fat, which contributes to significant weight gain.⁽⁶⁾

Previous research conducted by Michels et al. in 2012 showed that individuals with high stress levels tend to experience emotional eating more frequently than those who are not stressed.⁽⁷⁾ This phenomenon is relevant among medical students, who often experience intense academic pressure, ranging from the demands of exams, practicums, to clinical responsibilities.⁽⁸⁾ These conditions can worsen their eating patterns, increasing the risk of being overweight or obese.⁽⁹⁾ In addition, medical students often experience disrupted sleep patterns and lack of physical activity due to busy schedules, which further exacerbates the tendency of emotional eating and body fat accumulation. These factors suggest that emotional eating is not just an emotional response, but also the result of the interaction of various interrelated environmental, behavioral and psychological factors.⁽¹⁰⁾

A preliminary survey involving 32 students of the Medicine study program, Faculty of Medicine and Health Sciences, Sultan Ageng Tirtayasa University (UNTIRTA) found that 16 out of 32 students who filled out the questionnaire experienced excessive eating patterns under stress. Through a separate

questionnaire from before, the author conducted a survey again using google form to see the number of student populations experiencing excessive weight using Body Mass Index (BMI) or called Body Mass Index (BMI), this index measures how much a person's body composition is by determining the ideal weight category through classification using the BMI value range that has been determined by stakeholders in the health sector.

Based on the BMI classification set by the WHO Western Asia Pacific Region in 2000, the IMT score for underweight is set at <18.5 ; then for normal weight, the range of values is $18.5 - 22.9$; for the overweight category, the range of values is $23 - 24.9$; for the level I obesity category, the range of values is $25 - 29.9$; and for the level II obesity category, the range of values is >30 .⁽³⁾ Furthermore, the results obtained from a survey conducted by 17 students said that 29.5% of the total respondents experienced overweight problems, with 11.8% of them getting a BMI range of $23 - 24.9$ which is the classification of overweight; another 11.8% got a BMI range of $25 - 29.9$ which is the classification of obesity level I; and the remaining 5.9% got a BMI range >30 which is the classification of obesity level II.

The large number of medical students at Medical and Health Sciences Faculty Sultan Ageng Tirtayasa University who experience overweight problems in the description above indicates that overweight is a serious problem among medical students. Emotional eating is thought to be a supporting factor that contributes to the increased prevalence of weight gain, especially among students. Therefore, this study identifies emotional eating behavior among medical students through distributed questionnaires and determines the Body Mass Index (BMI) to determine the weight gain category for each students.

METHODS

This study is an analytic observational study using a cross-sectional study design with the aim of evaluating the non-causal relationship between the incidence of emotional eating as the independent variable and the problem of excess weight as the dependent variable, among medical students at the Faculty of Medicine and Health Sciences, Sultan Ageng Tirtayasa University. This research was conducted at Sultan Ageng Tirtayasa University campus A Pakupatan in Panancangan Village, Cipocok Jaya District, Serang City, Banten and was conducted from October 2024 to June 2025 (9 months).

Total Sample

The sample of this study were all students of the medical study program of the Faculty of Medicine and Health Sciences, Sultan Ageng Tirtayasa University at the preclinical education level and met the inclusion criteria. To get a sample size, this study used a categorical descriptive formula in order to determine the prevalence of a problem.

The minimum sample size required is 75 students of the preclinical level medical study program at the Faculty of Medicine and Health Sciences, Sultan Ageng Tirtayasa University. To anticipate respondents who did not meet the inclusion criteria, the researcher increased the minimum

sample size by 10%, so that the total number of respondents collected was 82 students of the preclinical level medical study program at Medical and Health Sciences Faculty of UNTIRTA who met the requirements of this study.

Sampling Technique

The sampling technique used is simple random sampling. This sampling technique is simpler and free from selection bias because it is done randomly. The reason for choosing this technique is because the population has a homogeneous tendency and does not have significant differences in terms of the variables under study (emotional eating and excess weight). This technique allows each student to have the same opportunity to be selected as a sample.

Data Collection Tools and Analysis Management

Research tools included a digital body scale brand “GEA” to accurately measure body weight, a stadiometer brand “SECA” to measure height, and a laptop or computer used for data processing and analysis. Quantitative data were analyzed using statistical software such as SPSS version 26.0, Stata, or R. To maintain the ethical aspects of the study, informed consent forms were used to obtain consent from respondents. The distribution of questionnaires was done efficiently through Google Forms.

This research material includes questionnaires used to measure emotional eating tendencies, such as the Dutch Eating Behavior Questionnaire (DEBQ), which has proven its validity and reliability according to Sonya, et al in 2019 and Musyafira in 2018.^(11; 12) In addition, the questionnaire used contains demographic data of respondents including age, gender, generation, and their eating habits, as well as supporting documentation such as records of weight and height measurements. The questionnaires that have been collected and categorized with the data obtained will be analyzed using the SPSS (Statistical Package for the Social Sciences) version 26.0 program.

Research Procedures

The procedure consisted of several stages. In the preparation stage, the researcher entered the questionnaire into Google form to be distributed online, then obtained a research permit from the relevant institution and ethical approval from the faculty's Health Research Ethics Committee (KEPK). The data collection stage involved sample selection using simple random sampling technique with the mechanism as described in the previous sub-chapter, then distributing questionnaires online, and measuring body weight and height directly to selected students to calculate BMI.

RESULTS AND DISCUSSION

Results

From a total of 82 medical students who were willing to be involved in this study, 12 students fell into the exclusion criteria, so that only 70 students were involved. Then the researcher re-randomized by taking 5 students to reach the minimum sample, so that a total of 75 students were involved in this study. Then the 12 students who fell into the exclusion criteria consisted of 10 students who were taking drugs that could affect weight such as anti-depressants, mood-stabilizers, and corticosteroid pain relievers during the data collection process, then 2 other students had postural abnormalities that could affect height such as herniated disc and scoliosis, then there were no students who were pregnant during the data collection process. The 75 medical students who met the inclusion criteria consisted of 21 students from the class of 2021, 14 students from the class of 2022, 20 students from the class of 2023, and 20 students from the class of 2024.

Respondent	Distribution		Total (Students)
Characteristics	Frequency	Percent (%)	
Gender			
Male	20	26.7%	75
Female	55	73.3%	
Age			
Early-mid teens	4	5.3%	75
(15-18 years)			
Late teens	71	94.7%	
(19-23 years)			
Class			
2021	21	28.0%	75
2022	14	18.7%	
2023	20	26.7%	

Table 1. Respondent Characteristics

Based on table 1, the respondents consisted of 26.7% male and 73.3% female, ranging in age from 15-18 years old by 5.3% to 19-22 years old by 94.7% with the largest proportion being in the 2021 batch of students at 28.0%.

Then, the proportion of the variables studied was analyzed univariately. Based on the operational definition in this study, BMI was categorized according to the WHO Western Asia Pacific classification, namely underweight (BMI <18.5); normal (BMI 18.5 - 22.9); overweight (BMI 23 - 24.9); and obesity (BMI ≥25), then recategorization was carried out into two new categories namely “not excess weight” (BMI <23) and “excess weight” (BMI ≥23), this was done in order to make overweight and obesity included in the same category so as to facilitate the data analysis process. In addition to the distribution of BMI data in this study also used the Dutch Eating Behavioral Questionnaire (DEBQ-13) questionnaire segment related to emotional eating which amounted to 13 questions to obtain data on eating habits influenced by emotions in each student consisting of two categories, namely “No emotional eating” if the mean of the scores obtained through filling out the questionnaire is less than equal to 2.35 (≤ 2.35) and “emotional eating” if the mean of the scores obtained through filling out the questionnaire is more than 2.35 (> 2.35).

Characteristics	Distribution	
	Frequency	Percent (%)
<i>Emotional Eating</i>		
Yes (mean > 2.35)	38	50.7%
No (mean ≤ 2.35)	37	49.3%
Total	75	100%
Body Mass Index (BMI)		
Excess weight (BMI ≥ 23)	28	37.3%
Not excess weight (BMI < 23)	47	62.7%
Total	75	100%
Body Mass Index (BMI) Based on Gender		
Male		
Excess weight (BMI ≥ 23)	11	55.0%

Not excess weight (BMI < 23)	9	45.0%
Total	20	100%
Female		
Excess weight (BMI ≥ 23)	17	30.9%
Not excess weight (BMI < 23)	38	69.1%
Total	55	100%

Table 2. Emotional eating and Body Mass Index Distributions

Based on table 2, it was found that a greater proportion of students who experienced emotional eating, namely 38 people (50.7%), a slight difference with those who did not experience emotional eating, namely 37 people (49.3%). In addition, a greater proportion was also found in students who at the time of data collection obtained BMI < 23 or called “not excess weight”, namely 47 people (62.7%) compared to those who got BMI ≥ 23 or called “excess weight”, namely 28 people (37.3%). Then the characteristics of BMI distribution based on gender show that the number of women who are excess weight in this study is more, namely 17 people when compared to men who are only 11 people.

In this study, the Chi-Square test was conducted to compare the proportion between students who experienced emotional eating and those who were excess weight medical students in Medical Faculty of Sultan Ageng Tirtayasa University.

<i>Emotional Eating</i>	Excess Weight				Total		<i>p-value</i>	OR
	Yes		No		N	%		
	N	%	N	%				
Yes	16	21.30%	22	29.30%	38	50.70%		
No	12	16.00%	25	33.30%	37	49.30%	0.387	1.51
Total	28	37.30%	47	62.70%	75	100%		

Table 3. The relations of emotional eating and overweight

Based on table 3, the p-value ($p > 0.05$) shows that there is no statistically significant relationship between the incidence of emotional eating and the incidence of excess weight in medical students at Medical and Health Sciences Faculty Sultan Ageng Tirtayasa University. The proportion of students

who are excess weight and have emotional eating habits (21.30%) is higher than students who are excess weight but do not have emotional eating habits (16.00%). So although in proportion there are more students with emotional eating who are excess weight but statistically insignificant.

Discussions

Based on the results listed in table 3, there is no statistically significant relationship ($p\text{-value} > 0.05$) between emotional eating and excess weight in medical students of Medical and Health Sciences Faculty Sultan Ageng Tirtayasa University. However, the findings of this study are not in line with several previous studies that found a significant relationship between emotional eating and excess weight. For example, a cross-sectional study by Wardani et al. in 2023 in Yogyakarta found that emotional eating was significantly associated with the incidence of obesity in adolescents, with a $p\text{ value} = 0.000$.⁽¹³⁾ Similarly, Nuraini et al. in 2022 also reported a significant association ($p = 0.028$) between emotional eating and obesity in female students at Jenderal Sudirman University.⁽¹⁴⁾

Based on the findings of this study, what distinguishes the results of this study from the previous studies above are population characteristics, research design, and control of confounding variables. Research conducted by Wardani et al. in 2023 with a sample size of 139 respondents showed a significant relationship between emotional eating and obesity, especially in adolescents and high school students. The population used in the study is age and psychosocially in a different developmental phase from medical students, so the response to emotional stress that triggers emotional eating behavior can be stronger and have a greater impact on eating patterns and body weight.^(13; 15)

In addition, differences in methodological design may affect the results. The study conducted by Wardani, et al. 2023 used a multistage random sampling method, thus ensuring that the subset of adolescents from different schools and neighborhoods in Yogyakarta was more representative of the adolescent population in the region. This will increase the generality of the results to the population of the region as a whole. In contrast, in this study (a group of medical students with a simple sample and a smaller population), the use of simple random sampling, although fulfilling the principle of randomness, is less likely to ensure the diversity of characteristics such as social background, differences in stress levels, or physical activity, all of which may affect the relationship between emotional eating and the occurrence of increased BMI.^(13; 15)

In addition to Wardani et al.'s study above, another study conducted by Nuraini et al. in 2022 with a larger sample size of 142 respondents also found a significant relationship between emotional eating and overweight, but the relationship became more significant after controlling for other variables such as supper syndrome and excess energy intake, indicating that the relationship between these two variables can be influenced by many external factors that must be thoroughly controlled.⁽¹⁴⁾

In addition, the insignificant results in this study are most likely caused by not further analyzing

other risk factors that have the potential to be confounding variables, such as gender, genetic predisposition, and environmental factors as well as a sample size that is too small. This is in line with another similar study conducted by Puspita and Rakhma in 2024 on students of Universitas Muhammadiyah Surakarta with a sample size of 105 students selected through the accidental sampling method also reported no significant relationship between emotional eating and nutritional status based on Body Mass Index (BMI) and Upper Arm Circumference (LiLA) ($p = 0.314$ and $p = 0.169$).⁽¹⁶⁾

Several factors may explain why the above research studies including the results of this study did not find a significant association between emotional eating and excess weight. First, variations in population characteristics, such as age, gender and cultural background, may affect the results. Second, differences in the methods of measuring emotional eating and nutritional status, as well as the measurement tools used, may lead to differences in results. Thirdly, the presence of other factors such as physical activity, diet and stress that are not controlled or accurately measured may be confounding variables that affect the relationship between emotional eating and body weight. Fourth, the sample population size used is too small, which may affect the variability of the data obtained from each group of variables.

In addition, emotional eating was higher in females or obese individuals compared to males or normal weight individuals, but there was no significant difference between the normal and overweight groups.⁽¹⁷⁾ This explains why in this study, with a respondent group dominated by individuals with a modest BMI, no statistically strong significance was found.

Limitations of a Research

This study also has several limitations (weaknesses) that need attention. Firstly, not analyzing important confounding variables such as gender, genetic predisposition, physical activity level, as well as environmental factors such as sleep patterns and academic pressure, may result in potential bias and reduce the accuracy of the interpretation of the relationship between the main variables. Secondly, the limited sample size may affect the statistical power, resulting in not reaching statistical significance, which may also be affected by respondent variability and uneven distribution of sample characteristics.

In addition, self-report questionnaire-based data collection also has the potential for information bias, especially in terms of reporting weight, height, and perceptions of eating behavior. Respondents may give inaccurate answers due to social reasons, self-perception, or ignorance of their daily eating habits.

CONCLUSION

Although this study found no statistically significant relationship between emotional eating and excess weight among medical students at the Faculty of Medicine and Health Sciences, Sultan Ageng Tirtayasa University, the discrepancy with prior research may be attributed to key differences in population characteristics, sample size, and methodological design. Previous studies by Wardani et al.

(2023) and Nuraini et al. (2022) demonstrated significant associations in more diverse and developmentally distinct populations, with stronger designs and control for confounding factors. In contrast, this study's narrower population scope, limited sample size, and lack of confounder analysis may have obscured potential relationships. Moreover, differences in emotional eating behaviors by gender and weight status, as well as unmeasured influences like physical activity and diet, likely contributed to the non-significant findings, emphasizing the need for more comprehensive and controlled future research.

REFERENCES

- 1) Auliannisaa, A., and B. Wirjatmadi. 2023. "The Relationship Between Emotional Eating and Food Consumption Pattern with Obesity in Final Year College Students." *Media Gizi Kesmas* 12(1):212–18.
- 2) Demir Kösem, Dilek, Şenay Demir, and Murat Bektaş. 2024. "The Effect of Middle and High School Students' Emotional Eating Behavior on Obesity." *Journal of Pediatric Nursing* 77:e257–62. doi:10.1016/j.pedn.2024.04.037.
- 3) Epel, Elissa S., Bruce McEwen, Teresa Seeman, Karen Matthews, Grace Castellazzo, Kelly D. Brownell, Jennifer Bell, and Jeannette R. Ickovics. 2000. "Stress and Body Shape: Stress-Induced Cortisol Secretion Is Consistently Greater among Women with Central Fat." *Psychosomatic Medicine* 62(5):623–32.
- 4) Freeland-Graves, J., Deborah B. Jacobvitz, and P. Sachdeva. 2018. "Role of Grandparents in Childhood Obesity during First Two Years of Life." *J Nutrition Health Food Sci* 6:1–11.
- 5) Kontinen, Hanna, Karri Silventoinen, Sirpa Sarlio-Lähteenkorva, Satu Männistö, and Ari Haukka. 2010. "Emotional Eating and Physical Activity Self-Efficacy as Pathways in the Association between Depressive Symptoms and Adiposity Indicators." *The American Journal of Clinical Nutrition* 92(5):1031–39.
- 6) Lai, Wai Kent, Sherina Mohd Sidik, Rampal Lekhranj, Wan Ying Gan, and Siti Irma Fadhillah Ismail. 2022. "Prevalence and Predictors of Overweight and Obesity among Adolescents in Seremban, Negeri Sembilan, Malaysia." *Cureus* 14(1).
- 7) Michels, Nathalie, Isabelle Sioen, Caroline Braet, Gabriele Eiben, Antje Hebestreit, Inge Huybrechts, Barbara Vanaelst, Krishna Vyncke, and Stefaan De Henauw. 2012. "Stress, Emotional Eating Behaviour and Dietary Patterns in Children." *Appetite* 59(3):762–69.
- 8) Morgan, Tamara. 2019. "Investigating the Demographic and Behavioural Predictors of Mental Health and Burnout in Medical Students: A Cross-Sectional Study."
- 9) MUSYAFIRA, ILENA DWIKA. 2018. "Hubungan Stres Dan Emotional Eating Pada Mahasiswa Tahun Pertama."
- 10) Ng, Marie, Tom Fleming, Margaret Robinson, Blake Thomson, Nicholas Graetz, Christopher Margono, Erin C. Mullany, Stan Biryukov, Cristiana Abbafati, and Semaw Ferede Abera. 2014. "Global, Regional, and National Prevalence of Overweight and Obesity in Children and

Adults during 1980–2013: A Systematic Analysis for the Global Burden of Disease Study 2013.” *The Lancet* 384(9945):766–81.

- 11) Nuraini, Marcelina, Erna Kusuma Wati, and Afina Rachma Sulistyning. 2024. “THE CORRELATION BETWEEN PHYSICAL ACTIVITY, EMOTIONAL EATING, EATING PATTERN, AND GENETIC TRAITS WITH OBESITY AMONG FEMALE STUDENTS.” *Journal of Nutrition College* 13(4):338–46. doi:10.14710/jnc.v13i4.41560.
- 12) Puspita, Ardina, and Luluk Rakhma. 2024. “Hubungan Emotional Eating Dengan Status Gizi Pada Mahasiswa Universitas Muhammadiyah Surakarta.” *Ghidza: Jurnal Gizi Dan Kesehatan* 8:258–65. doi:10.22487/ghidza.v8i2.1645.
- 13) Rohmah, Nurur. 2022. “STRES DAN PERILAKU EMOTIONAL EATING PADA MAHASISWA UNIVERSITAS NEGERI SEMARANG.”
- 14) Sonya, Anandyajati Mella. 2019. “Stres Dan Perilaku Makan Pada Mahasiswa.”
- 15) Vasileiou, V., and S. Abbott. 2023. “Emotional Eating among Adults with Healthy Weight, Overweight and Obesity: A Systematic Review and Meta-analysis.” *Journal of Human Nutrition and Dietetics* 36(5):1922–30.
- 16) Wardani, Hajar Surya, Sapja Sapja Anatayu, and Ratih Puspita Febrinasari. 2024. “Stress Level and Emotional Eating in Obese and Non-Obese Adolescents.” *AcTion: Aceh Nutrition Journal* 9(1):57–64. doi:10.30867/action.v9i1.1311.
- 17) World Health Organization. 2021. “Assessing the Existing Evidence Base on School Food and Nutrition Policies: A Scoping Review.”