

Correlation Between Stress Levels and Eating Behavior in College Students: A study at The Faculty of Health Sciences

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ABSTRACT

Background: *The demanding schedules of students within the Faculty of Health Sciences and their substantial course loads frequently lead to elevated stress levels among students. Stress can manifest positive and negative impacts on an individual's eating behavior. This study aimed to establish a correlation between stress levels and eating behavior in students enrolled at the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta.*

Research Methods: *A cross-sectional research design was employed, involving 88 students from the 2019 Faculty of Health Sciences, Universitas Muhammadiyah Surakarta class as the respondents. Stress levels were assessed using the Perceived Stress Scale (PSS-10) questionnaire while eating behavior data were gathered through the Adult Eating Behavior Questionnaire (AEBQ). The Pearson product-moment correlation test examined the relationship between stress levels and eating behavior.*

Research Result: *Among students of the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, in the 2019 class, 79.5% exhibited moderate stress levels. Regarding eating behavior, 54.5% of these students approached food, while 45.5% tended to avoid food. Notably, 54.5% of students from the Faculty of Health Sciences displayed mild levels of stress alongside an inclination toward approaching food in their behavior. The Pearson product-moment correlation test revealed a statistically significant relationship between stress levels and eating behavior, with a significance value of <0.05.*

Conclusion: *This study establishes a significant correlation between stress levels and eating behavior among students at the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta. Students must develop effective stress management strategies that are closely linked to regulating their eating behavior.*

BACKGROUND

Stress is a response that arises when there is a disparity between desired circumstances and expectations or when there is an overlap between environmental demands and one's capacity to meet them. It triggers feelings of danger, threat, disturbance, and an overwhelmed feeling. Stress is a phenomenon that can impact individuals universally, including students. When individuals encounter stress, it induces feelings of anxiety, fear, depression, and anger. The manifestation of stress varies from person to person and is influenced by individual characteristics, coping abilities, and the nature of the stressor (Musradinur, 2016). Stress has four distinct facets of impact, encompassing physical, cognitive, emotional, and behavioral. On the

physical front, stress can lead to sleep disturbances, muscle tension, pain, fatigue, reduced energy levels, and decreased appetite (Bressert, 2016).

Research on stress levels among students has been extensively conducted worldwide. In Southeast Asia, the prevalence of stress among students is reported at 16.4% (Dessauvagie et al., 2022). Research conducted at the Muhammadiyah University of Magelang revealed that stress levels among students vary, with 35.6% experiencing low stress, 57.4% experiencing moderate stress, and 6.9% experiencing high stress (Ambarwati et al., 2019). An investigation by the Health and Safety Executives in England, involving 487,000 productive individuals in 2013-2014, found that the incidence of stress was higher among women at 54.62% compared to men at 45.38% (World, 2014). This suggests that women may experience 2.2 times more stress than men, possibly due to differences in coping strategies, with women often relying more on emotions. In contrast, men tend to use more rational approaches when dealing with problems (Kountul et al., 2018). Coping stress strategies are essential techniques used to mitigate stress levels. These strategies may vary depending on an individual's stress level and personal preferences (Kamarullah, 2022).

There are various methods individuals typically employ to cope with stress, including prayer, meditation, listening to music, watching, engaging in favorite hobbies, confiding in parents or friends, exercising, practicing yoga, spending time on social media, and indulging in food consumption (Pariat et al., 2014). One of these coping methods is eating, characterized by consuming food not out of hunger but to satisfy emotional cravings, often referred to as emotional eating. Emotional eating represents a response to happiness, sadness, anger, and anxiety (Fathanah & Hashanah, 2021). Notably, women tend to resort to eating as a stress-coping mechanism, which can influence their eating behavior. This, in turn, may impact an individual's overall health and daily life, highlighting the importance of enhancing one's ability to regulate eating behavior (Nurwahidah et al., 2022).

Stress can significantly influence an individual's eating behavior by promoting overeating or encouraging undereating. Emotional overeating, characterized by excessive food consumption as a response to negative emotional states, has been associated with an elevated risk of obesity. In contrast, emotional undereating may be a protective factor (Buja, 2022). Excessive overeating can adversely affect physical and mental health, potentially contributing to eating behavior disorders (Reichenberger et al., 2020). It is noteworthy that psychological theories have historically given limited attention to emotional undereating, despite the natural inclination for some individuals to eat less in response to emotions, driven by biological mechanisms that suppress hunger (Bjørklund et al., 2019).

Eating behavior encompasses a series of actions that facilitate human interaction with food. The term 'food' not only pertains to the quantity and type of food but also encompasses the habits and emotions associated with eating (Benarroch et al., 2011). Numerous factors influence eating behavior, including individual characteristics, social interactions, physical environment, macroenvironmental factors, students' living conditions, social dynamics, lifestyle choices, and the pressures of exams (Deliens et al., 2014). It is worth noting that individuals in a positive emotional state tend to consume more food than those in a negative or neutral emotional state (Evers et al., 2013).

The Adult Eating Behavior Questionnaire (AEBQ) consists of two scales: emotional overeating and undereating. Individuals exhibiting emotional overeating tend to turn to food (food approach) as a response to negative emotions, which can result in weight gain. In contrast, individuals displaying emotional undereating tend to avoid food (food avoidance), which can be a protective measure against weight gain (Hunot-Alexander et al., 2019). Stress has been linked to increased daily food consumption (Cvetkovski et al., 2012). However, another study suggests that stress may decrease subsequent food intake (Abdulghani et al., 2011). Various factors, including cravings, stress, and the desired effects of food, appear to influence eating behavior (Pannicke et al., 2021).

Based on preliminary research conducted by researchers on 20 students from the Faculty of Health Sciences in 2022, findings revealed that 63.2% reported experiencing stress, while 56.2% exhibited poor eating behavior. Interestingly, only 19.6% of the students maintained a consistent meal schedule. Given these observations, the author is inclined to pursue a research study titled 'Correlation Between Stress Levels and Eating Behavior in College Students: A Study at the Faculty of Health Sciences, Muhammadiyah Surakarta University.'

MATERIAL AND METHODS

This study was conducted at Universitas Muhammadiyah Surakarta, employing a quantitative research approach with a cross-sectional design. The primary objective was to investigate the relationship between stress levels and eating behavior among students at the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta. The research was conducted with the appropriate permissions and ethical clearance from the Surakarta Islamic Hospital Health Research Ethics Commission under approval number 3.648/A-1/DIR/IX/2022.

The study's population comprised the regular students enrolled in the Faculty of Health Sciences at Universitas Muhammadiyah Surakarta in 2019, totaling 666 students. The sample size, consisting of 88 students, was determined using the Lemeshow formula. These samples were selected randomly and met specific criteria: a willingness to participate as research subjects, good overall health, and the absence of the consumption of certain drugs or vitamins known to influence appetite. The allocation of sample size for each study program is as follows: 22 students from Public Health, 24 students from Nursing, 22 students from Nutrition, and 20 students from Physiotherapy.

The Perceived Stress Scale (PSS-10), developed by Sheldon Cohen, demonstrates a commendable level of reliability, with a Cronbach's alpha value exceeding >0.70 . The PSS-10 comprises six positive items and four negative items. Stress levels are categorized based on the total questionnaire score as follows:

Mild stress: Score 0-13
Moderate stress: Score 14-16
High stress: Score 27-40

The dependent variable in this research is eating behavior. Measurements were conducted using the Adult Eating Behavior Questionnaire (AEBQ), developed by Claudia Hunot, which demonstrates satisfactory reliability with a Cronbach's alpha value exceeding 0.60. The AEBQ comprises 35 statement items categorized into eight characteristics, divided into two subscales: food approach and food avoidance. The food approach subscale includes four characteristics—hunger (H), food responsiveness (FR), emotional overeating (EOE), and enjoyment of food (EF). Meanwhile, the food avoidance subscale encompasses four characteristics—slowness in eating (SE), emotional undereating (EUE), satiety responsiveness (SR), and food fussiness (FF). The assessment with the Adult Eating Behavior Questionnaire (AEBQ) employs a Likert scale and categorizes eating behavior as follows: Eating behavior tends to avoid food if the subscales slowness in eating (SE), emotional undereating (EUE), satiety responsiveness (SR), and food fussiness (FF) are \geq mean. Eating behavior tends to approach food if the subscales hunger (H), food responsiveness (FR), emotional overeating (EOE), and enjoyment of food (EF) are \geq mean.

Data processing regarding stress levels and eating behavior commences with a meticulous examination of the subject's identity and questionnaire responses for completeness. Subsequently, the subject's response data is entered into data processing software. The data were processed utilizing SPSS 24 software. The analysis to ascertain the correlation between stress levels and eating behavior involved using the Pearson product-moment correlation test.

RESULTS

Table 1. Respondents Characteristics Distribution

Category	n	%
Gender		
Male	32	36.4
Female	56	63.6
Age		
20	3	3.4
21	70	79.5
22	11	12.5
23	4	4.5
Stress Levels		
Mild	14	15.9
Moderate	70	79.5
High	4	4.5
Eating Behaviors		
Approaching Food	48	54.5
Avoiding Food	40	45.5

According to the data presented in Table 1, the predominant demographic among respondents at the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, is women, comprising 63.3% of the total. Regarding age distribution, the majority falls within the 20-23 age group, with 21-year-olds representing 79.5% of respondents. Stress levels predominantly categorize students as experiencing moderate stress, encompassing 79.5% of the sample. Regarding eating behavior, most students exhibit food-approach eating behavior, accounting for 54.5% of the respondents.

Table 2. Analysis of the Correlation Between Stress Levels and Eating Behavior in College Students

Correlation	<i>p-value</i>	<i>r</i>
Stress levels on eating behavior	0.001	0.362

Table 3. Descriptive Statistical Test Results

	<i>Mean</i>	<i>Std. Deviation</i>
Stress Levels	54.75	6.374
Eating Behaviors	18.12	4.705

According to the findings presented in Table 2, the correlation test between stress levels and eating behavior, conducted using the Pearson product-moment correlation test, yielded a *p-value* of 0.001, less than the significance level of 0.05. This result signifies a statistically significant correlation between stress levels and eating behavior among students at the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, in 2019. The correlation coefficient, with a value of 0.362, indicates a positive relationship, signifying that the direction of the association is unidirectional. However, the correlation coefficient of 0.362 suggests that the strength of this relationship falls within the range of $0 < r < 0.5$, categorizing it as a weak positive correlation.

Table 3 shows that the stress level variable has an average of 54.75 with a standard deviation of 6.374. The research outcomes reveal that the standard deviation is smaller than the average, indicating an even data distribution. Conversely, the eating behavior variable exhibits a mean of 18.12 with a standard deviation 4.705. Once again, the research findings indicate that the standard deviation is smaller than the mean, indicating uniform data distribution.

Table 4. Stress Levels on Eating Behavior

		Eating Behaviors		
		Approaching Food	Avoiding Food	Total
Stress Levels	Mild and Moderate	54.5%	41%	95.5%
	High	0%	4.5%	4.5%
Total		54.5%	45.5%	100%

According to the data presented in Table 4, the analysis of stress levels about eating behavior reveals that 54.4% of students experiencing mild to moderate stress exhibit food approach behavior. In comparison, 4.5% of students with high stress demonstrate food avoidance behavior.

DISCUSSION

The criteria for stress levels are the same for both men and women; however, women tend to be more susceptible to feelings of guilt, fluctuations in appetite, sleep disturbances, and eating disorders (Sutjiato & Tucunan, 2015). Biologically, stress levels in men and women are influenced by the activity of the hypothalamus-pituitary-adrenal (HPA) axis and the sympathetic nervous system, which provide negative feedback during stressful experiences. Women typically have higher levels of oxytocin and estrogen than men, and these hormones play a pivotal role in stress regulation. Consequently, women tend to be more sensitive to activating the HPA axis system (Hafifah et al., 2017).

The majority of respondents in this study are adults, which aligns with previous research. Adults are particularly susceptible to stress due to internal and external factors (Dessauvague et al., 2022). Internal factors include a diminished capacity to effectively understand and cope with problems, while external factors encompass an increasingly heavy course load and falling short of expected academic performance (Dessauvague et al., 2022). As a demographic, students are especially vulnerable regarding eating behavior and appetite, leading to a heightened risk of disproportionate weight gain (Gonzales et al., 2017) and the emergence of eating disorders during college (Volpe et al., 2016).

Stress represents a condition that triggers interactions between individuals and their environment and can be categorized into three levels: mild stress, moderate stress, and high stress (Edward et al., 2012). Moderate stress involves challenging situations lasting from hours to days, aligning with previous research indicating that most students, precisely 66%, experience moderate stress levels (Luh et al., 2022). However, it is essential to note that while most students encounter mild to moderate stress, some also grapple with severe stress, potentially exacerbating eating disorders (Czepczor-Bernat et al., 2021). Furthermore, high-stress conditions can lead to eating behavior disorders, including significant reductions in food intake, resulting in body weight and image alterations (Haddad et al., 2020).

Eating behavior encompasses long-standing decisions made by individuals regarding when, what, how, how much, where, and with whom to eat. These decisions are often influenced by location, timing, and food choices (Fassah & Retnowati, 2014). Positive eating behavior has a beneficial impact on individual health by ensuring sufficient daily food intake. Conversely, poor eating behavior can have detrimental effects, leading to insufficient food consumption and potential alterations in an individual's nutritional status (Ni'mah et al., 2022).

Most students at the Faculty of Health Sciences exhibit an approach to their eating behavior, signifying notable changes in their eating habits. This observation aligns with previous research, highlighting significant shifts in final-year students' eating behavior (Wijayanti et al., 2019). The research findings indicate a direct correlation between increasing stress levels and alterations in eating behavior. The positive correlation coefficient value suggests a unidirectional connection, indicating that as stress levels rise, so does eating behavior. This finding is consistent with prior research indicating a reasonably strong correlation between stress and eating behavior in students (Masroni et al., 2023). Furthermore, other research supports the idea that stress and eating behavior are intertwined, as individuals often eat to alleviate the discomfort experienced during stressful situations (Fassah & Retnowati, 2014).

Under stressful conditions, individuals tend to adopt coping strategies of their preference. Coping with stress entails recovering from the effects of stress or the discomfort experienced by individuals (Pujiati et al., 2015). Coping mechanisms for stress vary from person to person due to differences in personality traits, stress types, and stress sources (Andriyani, 2019). In the case of students, their stress response can manifest through changes in eating behavior (Rahmawati, 2016).

Eating behavior comprises two distinct levels: food approach and food avoidance, which influence decision-making patterns related to food (Carnell et al., 2022). Food approach behavior involves responsiveness to food and emotional overeating, which can contribute to overweight and obesity, particularly in individuals with genetic predispositions (Konttinen et al., 2015; Mallan et al., 2017). Conversely, food avoidance behavior is characterized by a loss of appetite and eating difficulties driven by emotional factors, often associated with lower BMI and eating disorders in adults (He et al., 2020).

Research involving adults has revealed that individuals respond to stressful situations differently regarding their eating behavior. Some tend to increase their food consumption, a behavior known as emotional overeating, while others experience a reduced appetite and consume less, a phenomenon referred to as emotional undereating (Herle et al., 2017). Typically, there exists a positive correlation between emotional overeating and emotional undereating. Emotional overeating is more prevalent among adult women than men (Siminiuc et al., 2022).

Various stress mechanisms, including acute and chronic stress effects, can influence an individual's eating behavior. When individuals encounter stressful situations, their bodies initiate responses to manage stress. The mechanism involving acute stress effects commences with the release of Corticotropin-Releasing Hormone (CRH) from the hypothalamus in response to the stressor. CRH then triggers the release of Adrenocorticotropic Hormone (ACTH) from the pituitary gland, which affects neurons within the Arcuate Nucleus of the Hypothalamus (ARC). This specific neuronal population regulates eating behavior and suppresses energy expenditure (Suprayogi, 2011).

Research conducted at the Faculty of Medicine, Basrah University, has indicated that stress levels are significantly higher among female students, resulting in a tendency for these students to skip breakfast and consume food infrequently daily (Sominsky & Spencer, 2014). Another study revealed that food consumption among subjects slightly decreased when experiencing anger or anxiety but approached average levels when subjects were in happier or sadder emotional states. Furthermore, academic stress notably influenced the consumption of sweet foods. The emotion most closely associated with increased food consumption is sadness, while anger and anxiety are linked to reduced food intake (Al-Asadi, 2014).

CONCLUSIONS

This research has established a correlation between stress levels and eating behavior in students at the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, albeit with a weak correlation between the two variables.

RECOMMENDATION

Students should develop effective stress management techniques, as this can positively influence their eating behavior. For future research endeavors, it is recommended that researchers expand their respondent pool, mainly focusing on individuals experiencing higher stress levels.

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