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ASSOCIATIONS OF EMOTIONAL EATING, RESTRICTIVE EATING, AND ENERGY INTAKE WITH NUTRITIONAL STATUS IN ADOLESCENTS AT HEALTH POLYTECHNIC MINISTRY OF HEALTH TANJUNGKARANG BANDAR LAMPUNG

Hubungan Perilaku Makan Emosional, Perilaku Makan Restriktif, dan Asupan Energi dengan Status Gizi pada Remaja di Politeknik Kesehatan Kementerian Kesehatan Tanjungkarang, Bandar Lampung

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ABSTRACT

Emotional and restrictive eating are prevalent maladaptive behaviors during adolescence, yet empirical evidence linking these psychological eating styles to actual energy intake and objective nutritional status remains inconsistent. This study investigated the associations between emotional eating, restrictive eating, daily energy intake, and nutritional status among adolescents to inform targeted public health interventions. A cross-sectional study was conducted involving 75 adolescent students, selected from a population of 427, at the Health Polytechnic of the Ministry of Health Tanjungkarang, Bandar Lampung. Psychological eating behaviors were assessed using validated questionnaires, while actual energy intake was measured via 24-hour food recalls, and nutritional status was determined through anthropometric measurements. Data were analyzed using univariate, bivariate (Fisher's Exact Test), and multivariate approaches. Multivariate analysis identified daily energy intake as the most dominant predictor of nutritional status (OR = 6.2; 95% CI: 2.248–17.375), indicating that adolescents with inadequate energy intake exhibited a 6.2-fold higher risk of abnormal nutritional status. In contrast, neither emotional eating (p = 0.157) nor restrictive eating (p = 0.439) demonstrated a statistically significant direct association with nutritional status in this cohort. Although psychological eating behaviors are clinically relevant, direct energy intake remains the primary determinant of adolescent nutritional status. Effective interventions should adopt a cross-disciplinary approach, concurrently addressing actual dietary intake and the underlying psychological motives of eating.

Keywords: emotional eating, restrictive eating, energy intake, adolescents, nutritional status

ABSTRAK

Perilaku makan emosional dan restriktif merupakan perilaku maladaptif yang umum terjadi pada masa remaja, namun bukti empiris yang menghubungkan gaya makan psikologis ini dengan asupan energi aktual dan status gizi objektif masih tidak konsisten. Penelitian ini menyelidiki hubungan antara perilaku makan emosional, perilaku makan restriktif, asupan energi harian, dan status gizi pada remaja sebagai landasan untuk intervensi kesehatan masyarakat yang tepat sasaran. Sebuah studi potong lintang (cross-sectional) dilakukan dengan melibatkan 75 mahasiswa remaja, yang dipilih dari populasi 427 orang, di Politeknik Kesehatan Kementerian Kesehatan Tanjungkarang, Bandar Lampung. Perilaku makan psikologis dinilai menggunakan kuesioner yang tervalidasi, sementara asupan energi aktual diukur melalui food recall 24 jam, dan status gizi ditentukan melalui pengukuran antropometri. Data dianalisis menggunakan pendekatan univariat, bivariat (Uji Exact Fisher), dan multivariat. Analisis multivariat mengidentifikasi asupan energi harian sebagai prediktor paling dominan terhadap status gizi (OR = 6,2; CI 95%: 2,248–17,375), yang menunjukkan bahwa remaja dengan asupan energi yang tidak memadai memiliki risiko 6,2 kali lebih tinggi mengalami status gizi tidak normal. Sebaliknya, baik perilaku makan emosional (p = 0,157) maupun restriktif (p = 0,439) tidak menunjukkan hubungan langsung yang bermakna secara statistik dengan status gizi pada kohort ini. Meskipun perilaku makan psikologis relevan secara klinis, asupan energi langsung tetap menjadi penentu utama status gizi remaja. Intervensi yang efektif harus mengadopsi pendekatan lintas disiplin yang secara bersamaan menangani asupan makanan aktual dan motif psikologis yang mendasari perilaku makan.

Keywords: perilaku makan emosional, perilaku makan restriktif, asupan energi, status gizi, remaja

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INTRODUCTION

Adolescence is a critical developmental stage characterized by rapid physical growth, psychological maturation, and social transition. During this period, adolescents experience increased autonomy in food choices, heightened sensitivity to peer influence, body image concerns, and emotional instability, all of which may contribute to unhealthy eating behaviors.[1] In recent years, unhealthy dietary patterns among adolescents have become an important public health concern globally, particularly in developing countries undergoing nutritional transition, including Indonesia. The coexistence of undernutrition and overweight among adolescents reflects the complexity of nutritional problems influenced not only by dietary intake but also by psychological and behavioral factors.[2]

In Indonesia, adolescent nutritional problems continue to increase alongside changes in lifestyle, urbanization, and exposure to social media. National surveys have reported rising trends in overweight and obesity among adolescents, while undernutrition remains prevalent in several regions.[3] Adolescents are increasingly exposed to unrealistic body ideals promoted through digital media, which may encourage maladaptive eating behaviors such as emotional eating and restrictive eating.[4] Previous studies in Indonesian adolescents have shown that body dissatisfaction, stress, and social pressures contribute significantly to disordered eating tendencies and unhealthy dietary practices.[5,6]

Emotional eating (EE) refers to the tendency to consume food in response to emotional distress rather than physiological hunger cues.[7] Adolescents experiencing stress, anxiety, sadness, or academic pressure may use food consumption as a coping mechanism to regulate negative emotions. Emotional eating is often associated with increased intake of energy-dense foods high in sugar and fat, potentially leading to excessive energy intake and weight gain over time.[8] Recent evidence suggests that emotional eating is increasingly prevalent among adolescents and young adults due to psychosocial stressors, poor emotional regulation, and changes in lifestyle behaviors following the widespread use of digital technology and social media platforms.[9] Furthermore, emotional eating has been linked to obesity risk, depressive symptoms, and poor dietary quality among adolescents.[10]

Restrictive eating (RE), meanwhile, refers to the intentional limitation of food intake to control body weight or body shape.[11] Although restrictive eating is often initiated as a strategy for weight management, excessive dietary restraint may paradoxically increase the risk of overeating episodes and disordered eating patterns due to impaired self-regulation mechanisms.[12] Adolescents practicing restrictive eating may experience cycles of food restriction followed by uncontrolled eating, contributing to unstable nutritional status and unhealthy relationships with food.[13] Studies among university students have also demonstrated that restrictive eating behavior is associated with body dissatisfaction, anxiety, and unhealthy dieting practices.[14]

The relationship between emotional eating, restrictive eating, energy intake, and nutritional status is complex and multidimensional. Emotional eating may directly increase total energy intake through frequent consumption of highly palatable foods, while restrictive eating may alter eating patterns and metabolic balance through inconsistent dietary control.[15] However, findings from previous studies remain inconsistent. Some studies reported significant associations between emotional eating and obesity or overweight status[8,16], whereas other studies found no significant relationship between emotional eating and nutritional status among adolescents.[17] Similarly, evidence regarding restrictive eating and nutritional status remains inconclusive, suggesting that psychological eating behaviors may interact with other factors such as stress, dietary intake, physical activity, and environmental influences.[18]

Despite growing interest in eating behaviors among adolescents, previous studies have generally examined emotional eating, restrictive eating, and nutritional status separately. Limited evidence simultaneously evaluates psychological eating behaviors together with actual energy intake as determinants of adolescent nutritional status, particularly within Indonesian health education settings. Furthermore, adolescents studying in health-related institutions may possess higher nutritional knowledge, potentially influencing the manifestation of eating behaviors differently compared to the general adolescent population.

Therefore, investigating these relationships among students at the Health Polytechnic of the Ministry of Health Tanjungkarang is important to better understand the interaction between psychological eating patterns and dietary intake within this unique context.

This study aims to analyze the associations between emotional eating, restrictive eating, energy intake, and nutritional status among adolescents at the Health Polytechnic of the Ministry of Health Tanjungkarang, Bandar Lampung. The findings are expected to contribute to the development of integrated nutritional and psychological interventions to improve adolescent nutritional health and prevent maladaptive eating behaviors.

METHODS

This study employed a quantitative observational design using a cross-sectional approach to analyze the associations between emotional eating, restrictive eating, energy intake, and nutritional status among adolescents. The study was conducted at the Health Polytechnic of the Ministry of Health Tanjungkarang, Bandar Lampung, Indonesia, from January to March 2026.

The study population consisted of 400 adolescent students aged 15–24 years enrolled at the Health Polytechnic of the Ministry of Health Tanjungkarang. The sample size was determined using the Slovin formula with a 10 percent margin of error, resulting in a minimum sample of 75 participants. Respondents were selected using a simple random sampling technique to ensure equal opportunity for participation.

The inclusion criteria were actively enrolled students aged 15–24 years who agreed to participate in the study and completed all research procedures. Exclusion criteria included students diagnosed with eating disorders, those currently undergoing special dietary therapy, individuals with chronic illnesses affecting nutritional status or appetite, and pregnant adolescents.

Data collection was conducted using structured questionnaires and anthropometric measurements. Emotional eating and restrictive eating behaviors were assessed using the validated Dutch Eating Behavior Questionnaire (DEBQ). The questionnaire consisted of emotional eating and restrictive eating subscales measured using a Likert scale. Previous studies demonstrated acceptable validity and reliability of the DEBQ among adolescent populations, with Cronbach's alpha values above 0.70.[7] In this study, emotional eating and restrictive eating scores were categorized into low and high groups based on median score distribution.

Energy intake was assessed using a 24-hour food recall administered by trained enumerators through face-to-face interviews. Respondents were asked to report all foods and beverages consumed within the previous 24 hours. Nutrient intake was analyzed using Indonesian food composition tables and compared with the Indonesian Recommended Dietary Allowance (RDA). Energy intake was categorized as adequate if intake reached ≥80 percent of the RDA and inadequate if intake was <80 percent of the RDA.

Nutritional status was determined through anthropometric assessment by measuring body weight and height using standardized equipment. Body weight was measured using a calibrated digital scale with 0.1 kg precision, while height was measured using a microtoise with 0.1 cm precision. Body Mass Index (BMI) was calculated using the formula weight (kg)/height (m^2) and classified according to World Health Organization (WHO) criteria. Nutritional status was categorized as normal and abnormal, where abnormal status included underweight, overweight, and obesity categories.

Data analysis was conducted using SPSS software version 25. Univariate analysis was performed to describe respondent characteristics, eating behaviors, energy intake, and nutritional status using frequency and percentage distributions. Bivariate analysis was conducted using Fisher's Exact Test to examine the associations between emotional eating, restrictive eating, energy intake, and nutritional status. Variables with p-values <0.25 in bivariate analysis were included in multivariate analysis using binary logistic regression to identify the dominant factor associated with nutritional status. Statistical significance was determined at $p<0.05$ with 95 percent confidence intervals (CI).

This study received ethical approval from the Health Research Ethics Committee of Universitas Mitra Indonesia. All participants provided informed consent prior to data

collection, and confidentiality of participant information was maintained throughout the study.

RESULTS

Based on the data presented in the table, the distribution of energy intake, emotional eating, restrictive eating, and nutritional status among students at the Tanjung Karang Health Polytechnic, Bandar Lampung City, is as follows: 36 students (48.0%) had adequate energy intake, while 39 (52.0%) had in-adequate / poor energy intake. Regarding emotional eating, 49 students (65.3%) reported low levels, and 26 (34.7%) reported high levels. For restrictive eating, 55 students (73.3%) reported high levels, and 20 (26.7%) reported low levels. Finally, 42 students (56.0%) had a normal nutritional status, while 33 (44.0%) had an abnormal nutritional status.

Table 1
Sociodemographic Characteristics, Eating Behaviors, and Nutritional Status of the Adolescent Participants

Variable	Total	
	Participants (n)	%
Energy intake		
Adequate	36	48.0%
In-adequate	39	52.0%
Emotional Eating		
Low	49	65.3%
High	26	34.7%
Restrictive Eating		
Low	20	26.7%
High	55	73.3%
Nutritional status		
Normal	42	56.0%
Abnormal	33	44.0%

Table 2
Bivariate Analysis of Factors Associated with Nutritional Status Among Adolescents

Variable	Nutritional Status				*p-value*	OR	Total	
	Normal		Abnormal					
	n	%	n	%			n	%
Energy intake								
Adequate	28	37.3	8	10.7	0.000	6.250	36	48.0
In-adequate	14	18.7	25	33.3			39	52.0
Emotional Eating								
Low	30	40.0	19	25.3	0.157	1.842	49	65.3
High	12	16.0	14	18.7			26	34.7
Restrictive Eating								
Low	12	16.0	8	10.7	0.439	1.250	20	26.7
High	30	40.0	25	33.3			55	73.3

Table 3
Multivariate Analysis of Factors Associated with Nutritional Status Among Adolescents

Multivariate Analysis Variable	*p-value*	OR (95% CI)
Energy intake	0.000	6.250 (2.248-17.375)

Based on the Fisher's exact test results presented in the table 2, the relationship between emotional eating and student nutritional status was not statistically significant (p=0.157, OR = 1.842). Conversely, for the restrictive eating variable, the test also indicated no statistically significant relationship with nutritional status (p = 0.439, OR=1.250).

In contrast, a highly significant relationship was found between energy intake and nutritional status (p = 0.000). The odds ratio of 6.250 indicates that students with poor energy intake had 6.25 times the odds of having an abnormal nutritional status compared to those with good energy intake, establishing it as a significant factor.

The Table 3 above shows that the most dominant variable associated with nutritional status was energy intake, with an OR of 6.25 (95% CI: 2.248 to 17.375). This means that students with inadequate/poor energy intake had 6.25 times the odds of having an abnormal nutritional status compared to students with adequate energy intake.

DISCUSSION

This study examined the associations between emotional eating, restrictive eating, energy intake, and nutritional status among adolescents at the Health Polytechnic of the Ministry of Health Tanjungkarang, Bandar Lampung. The findings demonstrated that energy intake was significantly associated with nutritional status and emerged as the most dominant factor influencing abnormal nutritional status. In contrast, emotional eating and restrictive eating were not significantly associated with nutritional status. These findings indicate that actual dietary intake may play a more direct role in determining nutritional status among adolescents than psychological eating behaviors alone.

The present study found no statistically significant association between emotional eating and nutritional status. This finding suggests that emotional eating behaviors among adolescents in this population may not have been sufficiently severe or persistent to directly influence anthropometric outcomes such as BMI. Emotional eating is generally characterized by increased food consumption in response to negative emotions, including stress, anxiety, sadness, or loneliness, rather than physiological hunger.[7] Theoretically, emotional eating may contribute to excessive energy intake and subsequent weight gain due to increased consumption of highly palatable foods rich in sugar and fat.[10] However, the absence of a significant relationship in this study indicates that emotional eating does not necessarily translate into measurable nutritional abnormalities in all adolescent populations.

Several factors may explain this finding. First, the respondents in this study were students enrolled in a health polytechnic institution who likely possessed better nutritional knowledge and awareness compared to the general adolescent population. Higher nutritional literacy may enable adolescents to regulate food choices despite experiencing emotional distress. Previous studies have shown that nutrition-related knowledge and health awareness may moderate the effects of emotional eating on dietary intake and body weight.[14] Second, emotional eating behaviors among adolescents may fluctuate according to temporary emotional conditions and therefore may not consistently affect long-term nutritional status. Adolescents may engage in emotional eating occasionally without experiencing sustained excessive caloric intake sufficient to alter BMI significantly.

The findings of this study are consistent with those reported by Puspita and Rakhma (2024), who found no significant relationship between emotional eating and nutritional status among

university students.[17] Similarly, Wijayanti et al. (2019) reported that emotional eating was not significantly associated with nutritional status among college students.[19] However, the present findings differ from studies conducted in other populations showing that emotional eating contributes to overweight and obesity risk.[8,16] These inconsistencies may be explained by differences in study populations, sociocultural environments, stress levels, coping mechanisms, and methods used to assess eating behaviors.

This study also found no statistically significant association between restrictive eating and nutritional status. Restrictive eating refers to intentional efforts to limit food intake in order to control body weight or body shape.[11] Although restrictive eating is theoretically associated with nutritional imbalance and cycles of overeating, the findings suggest that restrictive eating behaviors among respondents may not have reached levels capable of significantly influencing nutritional status. Restrictive eating in this population may reflect conscious dietary control practices rather than pathological eating restraint.

Adolescents studying in health-related educational settings may adopt dietary restriction as part of healthy lifestyle practices rather than extreme dieting behavior. This may explain why restrictive eating did not significantly contribute to abnormal nutritional status in this study. Similar findings were reported by Ohara et al. (2014), who found that restrained eating behaviors among university students were not always associated with overweight or obesity.[20] In contrast, Fathimatuzzahra and Yanti (2024) identified a significant relationship between restrictive eating and nutritional status among adolescents.[18] Differences in findings may be influenced by variations in psychological stress, body image dissatisfaction, and environmental factors affecting eating behavior across study populations.

Although emotional eating and restrictive eating were not significantly associated with nutritional status, these psychological eating behaviors remain clinically important because they may contribute indirectly to unhealthy dietary patterns and future eating disorders. Previous literature has emphasized that emotional eating and restrictive eating frequently coexist and interact dynamically, potentially increasing vulnerability to obesity, binge eating, and psychological distress.[15] Therefore, psychological eating behaviors should still receive attention in adolescent health promotion programs, particularly because adolescence is a critical period for the development of long-term eating habits and self-regulation patterns.[1]

The most important finding of this study was the significant association between energy intake and nutritional status. Adolescents with inadequate energy intake had approximately six times higher odds of experiencing abnormal nutritional status compared to those with adequate energy intake. This finding confirms that dietary intake remains a primary determinant of nutritional status among adolescents. Adequate energy intake is essential to support rapid growth, physical activity, cognitive development, and metabolic processes during adolescence.[21] Both insufficient and excessive energy intake may contribute to abnormal nutritional outcomes, including undernutrition and overweight.

The present findings are consistent with previous studies reporting significant associations between energy intake and nutritional status among adolescents and young adults.[22] Inadequate dietary intake may result in insufficient nutrient availability required for growth and physiological functioning, whereas excessive caloric intake may increase fat accumulation and obesity risk. In this study, energy intake emerged as a stronger predictor of nutritional status than psychological eating behaviors, suggesting that actual dietary consumption may mediate the effects of emotional and restrictive eating on body weight outcomes.

The findings of this study have important implications for adolescent nutrition and health promotion programs. Interventions aimed at improving adolescent nutritional status should prioritize balanced dietary intake while also considering psychological factors influencing eating behavior. Nutrition education programs may be integrated with mental health support, stress management strategies, and healthy coping mechanisms to prevent maladaptive eating behaviors among adolescents. Schools and higher education institutions should also promote supportive environments encouraging healthy eating patterns, body positivity, and psychological well-being.

Several limitations should be acknowledged in this study. First, the cross-sectional design limits the ability to establish causal relationships between eating behaviors and nutritional status. Second, dietary intake and eating behaviors were assessed using self-reported instruments, which may be subject to recall bias and reporting bias. Third, the relatively small sample size and recruitment from a single health polytechnic institution may limit the generalizability of findings to broader adolescent populations. Future studies are recommended to use longitudinal designs, larger samples, and more comprehensive psychological assessments to better understand the dynamic relationships between emotional eating, restrictive eating, dietary intake, and nutritional status among adolescents.

CONCLUSION

This study found that energy intake was significantly associated with nutritional status among adolescents at the Health Polytechnic of the Ministry of Health Tanjungkarang, Bandar Lampung. Adolescents with inadequate energy intake had a higher risk of experiencing abnormal nutritional status compared to those with adequate energy intake. In contrast, emotional eating and restrictive eating were not significantly associated with nutritional status.

Energy intake was identified as the most dominant factor influencing adolescent nutritional status. These findings suggest that adequate dietary intake remains an important determinant of nutritional status among adolescents, while psychological eating behaviors may not directly affect nutritional outcomes in this population.

RECOMMENDATIONS

Integrated nutrition interventions focusing on adequate dietary intake and healthy eating behaviors are recommended to support adolescent nutritional health.

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