ADOLESCENT MENTAL HEALTH AND LIFESTYLE CHANGES: EXPLORING EATING DISORDERS AND PHYSICAL ACTIVITY DURING COVID-19

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ABSTRACT

Background: *Mental health, diet, and physical activity play an important role in adolescents development. However, previous studies have reported inconsistent findings on the relationship between mental health, eating disorders, and physical activity. The COVID-19 pandemic has negatively impacted mental health, potentially contributing to eating disorders and reducing physical activity.* **Objectives:** *This study aimed to examine the association between mental health, eating disorders, and physical activity in adolescents during the COVID-19 pandemic.* **Methods:** *A cross sectional quantitative study was conducted in 2022, involving 236 high school adolescents. Mental health was assessed using the Depression, Anxiety, and Stress Scale (DASS-21), eating disorders were evaluate with the Eating Attitudes Test (EAT-26), and physical activity levels were measured using the International Physical Activity Questionnaire (IPAQ).* **Results:** *More than 50% of adolescents experienced depression, anxiety, or stress with severity ranging from mild to very severe. While 82.6% of adolescents did not exhibit eating disorders, 63.6% had low physical activity levels. A significant association was found between depression and eating disorders (p=0.024), but no significant relationship was observed between anxiety (p=0.080) or stress (p=0.232) and eating disorders. Additionally, depression (p=0.411), anxiety (p=0.547) and stress (p=0.097) were not significantly associated with physical activity.* **Conclusion:** *During the COVID-19 pandemic, most adolescents experinced mental health challenges, maintened normal eating behaviors, and exhibited low physical activity. Depression was significantly correlated with eating disorders, while no significant associations were found between mental health variables and physical activity levels.*

Keywords*: mental health, eating disorders, physical activity, COVID-19 pandemic, adolescents*

INTRODUCTION

Mental health plays a significant role in the overall health status of adolescents aged 10-19 globally. Disorders such as depression, anxiety, and stress account for 15% of the global disease burden in this age group[1]. The decline in adolescent mental health in recent years has been further exacerbated by the COVID-19 pandemic, which occurred from 2020 to 2022[2]. A study in Siberia showed a link between mental health, diet, and physical activity in adolescents aged 12 to 16 during the COVID-19 pandemic[3].

Quarantine measures during the COVID-19 pandemic may contribute to eating disorders and an increase in stress-related symptoms[4]. Several studies indicate that the COVID-19 pandemic negatively impacts mental health, potentially leading to eating disorders[5,6]. For example, Fernandez-Aranda et al. (2020) reporteda 38% increase in eating disorder symptoms and a 56% increase in anxiety among 32 patients during the COVID-19 pandemic[7]. Cooley and Toray (2001) also reported that 63% of patients with anorexia nervosa and 57% of patients with bulimia nervosa had a history of high stress levels before suffering from eating disorders[8]. This condition is also exacerbated by limited access to health care so that individuals who need health care assistance cannot

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be met, even though prolonged eating disorders can cause somatic complications in organs, such as the heart, digestive, musculoskeletal, skin, liver, endocrine, and nervous[9,10].

In addition, the level of physical activity is an important concern during adolescence. It plays a crucial role in immunity and overal health, including cardiometabolic, bone, and mental health[11]. However, physical activity patterns were disrupted during pandemic, influenced by mental well-being and parental support or control[12].

While previous studies have explored the impact of the COVID-19 pandemic on adolescent mental health and related behaviors, most of them were conducted in high-income countries or used non-representative samples. Additionally, many focused on one behavioral outcome (e.g., only eating disorders or physical activity) and not on the interconnectedness between mental health, eating behavior, and physical activity. Few studies have been conducted in Southeast Asian contexts like Indonesia, which has distinct sociocultural dynamics, academic pressure, and family environments that may affect adolescents differently.

This study therefore aimed to fill that gap by examining the associations between mental health, eating disorders, and physical activity in adolescents attending senior high school in Yogyakarta, Indonesia, during the later phase of the COVID-19 pandemic. By offering localized insights, the study is expected to provide valuable evidence for designing culturally relevant interventions to promote adolescent well-being in similar low- and middle-income country contexts.

METHODS

This observational study employed a cross-sectional design and was conducted in one of the most competitive public high schools in the Special Region of Yogyakarta, known for its rigorous academic environment. The school was selected because it likely represents a student population with high academic demands and potential mental stress, aligning with the study's aim to assess the relationship between mental health, eating disorders, and physical activity. Students were recruited from grades X and XI, aged 15–18 years. Adolescents were excluded if they were following a specific medical diet or had physical limitations that restricted their ability to engage in physical activities.

Data were collected using a structured, self-reported questionnaire distributed via Google Forms. The link to the form was disseminated through class group chats using a broadcast message. Prior to data collection, a virtual meeting via Zoom was held with class leaders and selected student representatives to provide instructions on how to properly complete the questionnaire. Each section of the form included brief written guidance to assist participants in understanding and responding to the questions accurately.

Mental health status was assessed using the DASS-21 questionnaire, which has been validated with a high validity score of 0.71 and a reliability coefficient of 0.93 based on Cronbach's alpha[13]. Eating disorders were evaluated using the Indonesian version of the EAT-26, which has demonstrated a validity coefficient of 0.361 and a reliability coefficient of 0.907[14]. Physical activity levels were measured using the International Physical Activity Questionnaire (IPAQ). Sampling was conducted using a proportionate stratified sampling technique to ensure balanced representation across class levels. Ethical approval was obtained from the Medical and Health Research Ethics Committee (MHREC) under approval code KE/FK/0224/EC/2022.

RESULTS AND DISCUSSION

A total of 236 subjects participated in the study. Table 1 presents the essential characteristics of the subjects. The majority (74.2%) were female, while only 25.8% were male. Most participants were aged 15–16 years (63.6%), and the distribution between grade X and XI students was relatively balanced, at 53% and 47%, respectively. Regarding monthly household income, most adolescents (67.4%) came from families earning more than 3 million IDR per month, which is categorized as middle-to-upper income.

The mental health variables in this study were assessed using the DASS-21 questionnaire, which consists of 21 items divided into three aspects: seven items for depression, seven for anxiety,

Table 1. Characteristics of Research Subjects

		n	%
1	**Gender**		
	a. Female	175	74.2
	b. Male	61	25.8
2	**Age**		
	a. 15–16 years old	150	63.6
	b. 17–18 years old	86	36.4
3	**Grade**		
	a. X	125	53
	b. XI	111	47
4	**Household Income**		
	a. 1–3 million	77	32.6
	b. 4–6 million	68	28.8
	c. 7–9 million	41	17.4
	d. > 9 million	50	21.2
	Total	**236**	**100**

Table 2. Classification of Mental Health, Eating Disorders, and Physical Activity of The Study Participants

	n	%
Depression		
Normal	104	44.1
Mild	57	24.2
Moderate	46	19.5
Severe	20	8.5
Very severe	9	3.8
Anxiety		
Normal	52	22.0
Mild	30	12.7
Moderate	68	28.8
Severe	27	11.4
Very severe	59	25.0
Stress		
Normal	117	49.6
Mild	54	22.9
Moderate	29	12.3
Severe	24	10.2
Very severe	12	5.1
Eating Disorders		
Dieting	33	80.5
Bulimia	0	0
Oral Control	6	14.6
Dieting & Oral Control	2	4.9
Physical Activity		
Low	150	63.6
Moderate	52	22.0
High	34	14.4
Total	**236**	**100**

and seven for stress. Overall, fewer than 50% of adolescents had depression, anxiety, and stress levels within the normal range. This indicates that half of the total subjects experienced varying degrees of depression, anxiety, and stress.

The results of the study (Table 2) show that while 44.1% of adolescents reported normal levels of depression, 55.9% experienced varying degrees, with 12.3% classified as having severe or very severe depression. This result was notably higher than the national prevalence of depression among Indonesians aged 15-24, reported at 6.2%, and also exceeded the regional prevalence in the Special Region of Yogyakarta, which stands at 5.5%[15]. While differences in prevalence might partly be attributed to the use of different assessment tools—DASS-21 in this study versus the Self Reporting Questionnaire-20 (SRQ) in the National Basic Health Research (Riskesdas)—other contributing factors must also be considered. For instance, this study was conducted in one of the most academically competitive public high schools in Yogyakarta, where academic pressure, performance expectations, and social comparisons might contribute to increase psychological distress among students.

Depression in adolescence is a complex condition influenced by multiple psychosocial factors, such as perceived isolation, fear of failure, family pressure, and uncertainty about the future[16–18]. These stressors may cumulatively lead to emotional exhaustion and reduced mental resilience. Although a study from South Korea reported that 56% of adolescents with severe depression experienced suicidal ideation,[19] such cross-cultural comparisons should be interpreted with caution unless cultural, educational, and social contexts are explicitly examined. Future research is needed to explore context-specific risk factors that may contribute to the elevated levels of depression among Indonesian adolescents.

Table 2 shows that 22% (n=52) of adolescents had a normal anxiety level, 12.7% (n=30) of adolescents had a mild anxiety level, 28.8% (n=68) of adolescents had a moderate anxiety level, 11.4% (n=27) of adolescents had a severe anxiety level, and 25% (n=59) of adolescents had a very severe anxiety level.

The findings of this study indicated that the majority of adolescents (78%, n = 184) experienced some level of anxiety, ranging from mild to very severe. This proportion was notably higher than national and regional figures. Based on the Indonesian Basic Health Survey data, the prevalence of mental-emotional disorders in individuals aged ≥15 years in Indonesia increased from 6.0% in 2013 to 9.8% in 2018. In the Special Region of Yogyakarta, the prevalence also rose from 8.1% to 10.1% in the same period[15].

Although this study did not specifically assess academic stressors, anxiety in adolescents was frequently associated with academic-related pressures. Previous research by Hasibuan and Riyandi (2019) reported that 54.8% of students identified examinations as the primary source of anxiety[20]. Given that this study was conducted in one of the most academically competitive public high schools in Yogyakarta, it was plausible that such stressors contributed to the elevated anxiety levels observed in the sample. However, this remains speculative and highlights the need for further studies that directly examine academic stress in relation to anxiety symptoms. Anxiety responses can vary across individuals, depending on their ability to adapt and manage anxiety-inducing situations[21]. While anxiety is a normal emotional reaction to threats or challenging circumstances, excessive or poorly managed anxiety can interfere with daily functioning and potentially affect adolescents' mental and physical health[22].

A total of 49.6% (n=117) of adolescents had normal stress levels, 22.9% (n=54) of adolescents had mild stress levels, 12.3% (n=29) of adolescents had moderate stress levels, 10.2% (n=24) of adolescents had severe stress levels, and 5.1% (n=12) of adolescents had very severe stress levels. This study showed that half of the subjects experienced stress at various levels (50.4%, n=119). The proportion of the results of this study was per the results of research by Siwi and Qomaruddin (2021) on students at Senior High School 16 Surabaya with the DASS-21 research instrument, namely 61% (n=202) of students had a normal stress level, 13% (n=44) of students had a mild stress level, 16% (n=54) of students had a moderate stress level, 8% (n=26) of students had a severe stress level, and 2% (n=4) of students had a very severe stress level[23]. These findings suggested that stress among adolescents is a common condition and should be addressed as part of efforts to promote mental health in the school environment.

A research by Maia and Dias' (2020) showed that there was an increase in the depression, anxiety, and stress level in students during the COVID-19 pandemic compared to before the pandemic. The study showed that the quarantine period harms student psychology[24]. A study by Siwi and Qomaruddin (2021), found a relationship between feelings of loneliness and levels of depression, anxiety, and stress in students[23]. One of the causes of mental stress faced by students during the pandemic is the burden of learning tasks[25]. Moreover, students adjust to new learning methods, maintain good grades, and plan for the future or prepare to enter their destination universities. This task often caused discomfort in many students as they must adapt and accept all the changes that occur[26].

The students are included in the adolescents experiencing emotional peaks due to high emotional upheaval due to the transition to adulthood. Biological and psychological changes and developments[26] can cause these emotional peaks. Biological changes in adolescents include the growth of limbs that result in changes in body shape. Changes in unbalanced body posture affect adolescents' acceptance of themselves, which can impact their emotional development. Psychological changes in adolescents are the state of the soul that is still fickle and immature so that when facing problems, they act in a hurry to explode their emotions without thinking critically first[27]. In addition to these changes, other factors that can affect emotions in adolescents are changes in patterns of interaction with parents, changes in interaction with peers, and changes in the outside world's view towards themselves[28]. These changes increase adolescents' sensitive and reactive nature to specific events or situations.

Not all adolescents realized that they are not well or are distressed. More than two-thirds of adolescents did not discuss their difficulties and seek help with mental health[29]. Emotional support had a positive impact on sufferers (reference?).

Other research showed that 78.8% of adolescents need the presence and emotional support of family to deal with their problems[30]. Releasing adolescents who experience mental distress to solve their problems without any assistance couldmake adolescents feel alienated. Delayed treatment can affect the adolescent's growth and development process, especially if they have high levels of depression, anxiety and stress[31]. Adolescents must realize that they need help if they have mental distress, both from themselves and others.

During the pandemic, mental health problems were one of the most prominent social problems, and people tend to have negative emotions such as worry, panic and confusion[32]. Research reported that there is a high prevalence of mental health problems, including emotional stress, anxiety, depression, and other symptoms during the COVID-19 pandemic[33]. High school adolescents who have experienced excellent learning pressure during the COVID-19 pandemic are at a period of risk for high levels of depression, and excessive life pressure can cause difficult emotional adjustment and psychological health problems[32]. One of the characteristics of depression is prolonged stress and anxiety, which inhibits physical activity and lowers physical quality[34].

In this study, the risk of eating disorders was evaluated using the EAT-26 questionnaire which measures dieting behavior, bulimia, and oral control. Results showed that 17.4% (n=41) of adolescents were at high risk of developing eating disorders. Among them, the vast majority (80.5%, n=33) reported engaging in dieting behaviors, while 14.6% (n=6) demonstrated oral control, 4.9% (n=2) exhibited both behaviors, and none reported bulimic behaviors (0%). While these findings werre consistent with previous studies by Melani et al. (2021) and Tumenggung & Talibo (2018), they rose concerns regarding the potential misinterpretation of dieting as a normative or even positive behavior among adolescents rather than a symptom of disordered eating.[35,36]

Furthermore, the 17.4% of students at risk of eating disorders in this study exceeds the global prevalence, which rose from 3.5% (2000–2006) to 7.8% (2013–2018), and surpasses the 9.1% reported by Tumenggung & Talibo (2018)[36,37]. These discrepancies suggested the need to contextualize findings within local cultural norms. In Indonesia, thinness is often idealized, particularly among young women, and exposure to media promoting slim body ideals may intensify dieting behavior. Social media platforms, influencers, and advertising may subtly reinforce body dissatisfaction, contributing to restrictive eating patterns[36,38].

Table 3. Level of Eating Disorder in the Study Participants

Gender	Eating Disorder		Total N(%)
	Normal n(%)	Abnormal n(%)	
Female	145 (61.4)	30 (12.7)	175 (74.2)
Male	50 (21.2)	11 (4.7)	61 (25.8)
Total	195 (82.6)	41 (17.4)	236 (100)

Table 2 shows that more than half of the respondents had low physical activity levels, reaching 63.6%. This finding was much higher than the Basic Health Research 2018 report, D.I Yogyakarta, of 28.1% for the population aged ≥10 years[15]. While the difference in measurement tools might contribute to this discrepancy, it was unlikely to be the sole explanation. One plausible factor was the impact of social restrictions during the COVID-19 pandemic, which significantly limited adolescents' opportunities for outdoor activities and school-based physical education. These conditions contrast with the pre-pandemic context of the 2018 survey.

In addition, the high prevalence of low physical activity became more concerning when paired with elevated dieting behaviors among adolescents, as found in this study. This trend might reflect broader socio-environmental challenges, such as academic pressure, increasingly sedentary lifestyles, and limited access to safe recreational spaces. Together, these findings highlighted the need for integrated public health strategies that go beyond promoting nutritional knowledge to also include body image literacy, critical media consumption, and culturally relevant healthy lifestyle interventions.

Table 4. Association Between Mental Health and Eating Disorders

Mental Health	Eating Disorders		Total	*p*
	Normal n(%)	Abnormal n(%)	n(%)	
Depression				
Normal	91 (87.5)	13 (12.5)	104 (100)	0.024
Mild	49 (86.0)	8 (14.0)	57 (100)	
Moderate	37 (80.4)	9 (19.6)	46 (100)	
Severe	13 (65.0)	7 (35.0)	20 (100)	
Very severe	5 (55.5)	4 (44.5)	9 (100)	
Anxiety				
Normal	47 (90.4)	5 (9.6)	52 (100)	0.080
Mild	23 (76.7)	7 (23.3)	30 (100)	
Moderate	60 (88.2)	8 (11.8)	68 (100)	
Severe	22 (81.5)	5 (18.5)	27 (100)	
Very severe	43 (72.9)	16 (27.1)	59 (100)	
Stress				
Normal	101 (86.3)	16 (13.7)	117 (100)	0.232
Mild	45 (83.3)	9 (16.7)	54 (100)	
Moderate	24 (82.8)	5 (17.2)	29 (100)	
Severe	17 (70.8)	7 (29.2)	24 (100)	
Very severe	8 (66.7)	4 (33.3)	12 (100)	

Association between Mental Health and Eating Disorders

Table 4 illustrates that adolescents who have very severe depression experienced eating disorders with a percentage of 44.5%. It can be concluded that the more severe the condition of depression experienced by adolescents, the higher the risk of having eating disorders. The results of this study were per the results of research by Blinder et al. (2006), in which about 50-75% of people with eating disorders experienced severe depressive disorders, which put them at greater risk for suicide[39].

Depression itself is a multifactorial disorder that impairs an individual's function, including interpersonal, social, and professional. It is characterized by mood swings, loss of initiative, general lack of interest and motivation, eating and sleeping disorders, lack of self-care, and decreased ability to concentrate[40,41]. From the characteristics and symptoms of depression, it can be seen that someone who is depressed in general will reduce their activities due to loss of mood and motivation in themselves. These characteristics and symptoms of depression were in line with the results of the study that adolescents who experience depression reduced or limited their eating activities by dieting and oral control so that they are at risk of eating disorders. However, this does not rule out the possibility that someone who is depressed will overeat. The study ofAngraini (2014) showed a relationship between depressive symptoms and nutritional status. A person's depressed condition could make the individual to eat more or even avoided to eat. [42].

Although the results of this study and other studies showed an association between depression levels and the risk of eating disorders, some studies showed no association at all. According to a study by Adji et al. (2019) showed that depressive symptoms did not affect the incidence of eating disorders[43].

The results of this study also showed that anxiety and stress levels had no association with eating disorders. These results aligned with the research by Kusuma et al. (2010) and Ngan et al. (2017); namely, there was no significant association between stress and the risk of eating disorders[44,45]. The study was per the results of research by Lestari et al. (2017) and Kristanti (2020), which showed a relationship between stress levels and the risk of eating disorders in adolescents[46,47].

A research stated that chronic stress was significantly associated with an increased risk of eating disorders, where 25-75% of anorexia nervosa patients were found to suffer from chronic stress[48]. Based on a study by Rohmawati et al. (2015), there was a statistically significant correlation between moderate anxiety levels and excessive food intake. However, there was no association between moderate anxiety levels and less food intake[49]. This result showed that subjects who feel anxious tend to have overeating habits. The results of these studies did not match the results of this study because there might be differences in methods, research instruments, and subject populations.

From the results of this study, it could be concluded that not all adolescents who had anxiety and stress were at risk of eating disorders because adolescents managed their reactions to anxiety and stress through other things except deviant

eating habits. The differences in research results mentioned above still need to be studied further because, so far in Indonesia, there has not been much research on eating disorders, especially their relation with mental health. This lack of research might occur because diseases related to mental disorders are still considered trivial, and the dangers are not understood. Due to the lack of research, the relationship between mental health and eating disorders is still unknown. This study was also unable to determine the exact cause and effect factors because the variables were studied simultaneously. Nevertheless, this study shows statistically and logically that depression was a factor in the high risk of eating disorders.

Association between Mental Health and Physical Activity

Table 5 shows that there was no significant relationship between the level of depression, anxiety and stress with physical activity (p>0.05).

This study did not find a significant association between depression, anxiety, or stress and physical activity levels among adolescents. Several factors might explain this finding. First, the measurement of physical activity using the International Physical Activity Questionnaire (IPAQ), which was self-reported by adolescents, might be subjected to bias, especially during the COVID-19 pandemic. In general, individuals tend to overestimate their physical activity or respond in ways that did not reflect their actual habits[50]. Moreover, more than half of the participants were female (74.2%), a group that was known to have lower physical activity levels compared to males[51]. This demographic imbalance might also have contributed to the absence of a significant relationship.

Additionally, although previous studies have shown strong associations between physical activity and mental health, including depression[52,53], anxiety[54], and stress[55,56], these relationships might not have been detected in this study due to other unmeasured mediating variables. For instance, anxiety and stress were often associated with emotional eating and binge-eating behaviors rather than reduced physical activity. Factors such as body image perception,

Table 5. Association Between Mental Health and Physical Activity in the Study Participants

Mental Health	Physical Activity			Total N(%)	*p*
	Low n(%)	Moderate n(%)	High n(%)		
Depression					
Normal	64 (61.5)	27 (26.0)	13 (12.5)	104 (100)	0.411
Mild	37 (64.9)	14 (24.6)	6 (10.5)	57 (100)	
Moderate	29 (63.0)	8 (17.4)	9 (19.6)	46 (100)	
Severe	14 (70.0)	1 (5.0)	5 (25.0)	20 (100)	
Very severe	6 (66.7)	2 (22.2)	1 (111)	9 (100)	
Anxiety					
Normal	32 (61.5%)	11 (21.2)	9 (17.3)	52 (100)	0.547
Mild	19 (63.3%)	5 (16.7)	6 (20.0)	30 (100)	
Moderate	43 (63.2%)	18 (26.5)	7 (10.3)	68 (100)	
Severe	18 (66.7)	7 (25.9)	2 (7.4)	27 (100)	
Very severe	38 (64.4)	11 (18.6)	10 (17.0)	59 (100)	
Stress					
Normal	72 (61.5)	28 (24.0)	17 (14.5)	117 (100)	0.097
Mild	34 (63.0)	15 (27.8)	5 (9.2)	54 (100)	
Moderate	17 (58.6)	6 (20.7)	6 (20.7)	29 (100)	
Severe	19 (79.1)	1 (4.2)	4 (16.7)	24 (100)	
Very severe	8 (66.6)	2 (16.7)	2 (16.7)	12 (100)	

peer influence, or coping mechanisms might also mediate the impact of mental health on lifestyle behaviors yet were not explored in this study.

Another possibility was that the sample size, while sufficient for primary analyses, might not have been large enough to detect more subtle associations or interaction effects. Previous studies have also suggested that the relationship between depression and physical activity might be bidirectional[52], which adds complexity to the interpretation of the results. Future studies should consider including a broader range of psychosocial variables and a more balanced sample, while also using objective measurements of physical activity to strengthen the reliability of the findings.

This study has several strengths worth highlighting. First, it addressed a timely and important topic by examining the relationship between mental health, eating disorders, and physical activity among adolescents in the COVID-19 pandemic. The study provides a multidimensional perspective by exploring multiple interrelated behavioral and psychological health outcomes in adolescents, contributing valuable insight for integrated public health strategies Nevertheless, some limitations should be acknowledged. The cross-sectional design prevents establishing causal relationships between mental health symptoms and behavioral outcomes such as eating disorders or physical activity. Data collection via self-reported online questionnaires, although practical during the pandemic, may introduce reporting bias, particularly for physical activity measures. In addition, the study did not directly assess mediating factors such as academic pressure, body image perception, or media influence, which are known to contribute to both mental health and eating disorders. Lastly, the predominance of female participants (74.2%) also limits the generalizability of the findings to adolescent males.

CONCLUSIONS

The results showed that adolescents who have normal levels of depression, anxiety and stress are still below 50%, which means that during the COVID-19 pandemic, most adolescents have depression, anxiety and stress, with levels varying from mild to very severe. Only 17.4% of adolescents experienced eating disorders, with most of them in the form of dieting behaviours. The physical activity levels of most adolescents in this study fell into the low category. There was a significant relationship between depression level and eating disorders ($p = 0.024$), but there was no significant relationship between anxiety level ($p = 0.080$) and stress level ($p = 0.232$) with eating disorders. Meanwhile, there was no significant relationship between the level of depression ($p = 0.411$), anxiety ($p = 0.547$) and stress ($p = 0.097$) with physical activity.

The absence of a significant relationship between anxiety or stress and eating disorders in this study contrasts with previous findings that commonly link these psychological states with emotional and binge-eating behaviors. To strengthen future research, it is recommended to consider a larger sample size and explore additional mediating factors such as body image perception, peer influence, and media exposure, which may play a role in adolescent eating behaviors. Moreover, future studies may benefit from combining quantitative assessments with qualitative approaches to better capture the complexity of disordered eating and its psychological determinants.

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