



Determinants of Binge Eating Behaviour in Adolescents

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ABSTRACT

Binge eating behavior is described as a state of loss of control over eating large amounts of food compared to a normal person over a period of time. Binge eating behavior is found to be common among adolescents and has become a public health problem with substantial physical and mental health impacts and increases with age. In Indonesia, research on binge eating is relatively rare so that it cannot describe the prevalence of binge eating in general. The purpose of this study is to analyze the relationship of self-esteem, eating restrictions, BMI, and emotional regulation to binge eating behavior. This research uses a quantitative method with a cross-sectional study. The sample in the study amounted to 346 participants. Data collection techniques using the Modified BES (Binge Eating Scale) questionnaire, DERS-SF (Difficulty Emotional Regulation - Short Form), RSES (Rosenberg Self Esteem Scale), and eating restriction questionnaire that has been tested for validity and reliability. The results of this study showed that there was a significant relationship between binge eating and self-esteem ($p=0.02$), emotional regulation ($p=0.00$), and eating restriction ($p=0.02$). Multivariate analysis showed that eating restriction had the strongest relationship ($p=0.02$). This study can be concluded that emotion regulation, self-esteem, and eating restriction are risk factors for binge eating behavior and eating restriction is the strongest factor. BMI Z-score showed a negative correlation with the incidence of binge eating in adolescents. Suggestion: It is expected that schools can provide emotional assistance through counseling guidance to students both related to mental health and knowledge about eating behavior and proper diet.

Keywords: binge eating behavior, adolescent, psychological factors, dietary restraint, BMI

ABSTRAK

Perilaku binge eating digambarkan sebagai keadaan hilangnya kontrol makan dalam jumlah besar dibandingkan dengan orang normal pada periode waktu tertentu. Perilaku binge eating ditemukan umum di kalangan remaja dan telah menjadi masalah kesehatan masyarakat dengan dampak kesehatan fisik dan mental yang substansial serta meningkat seiring bertambahnya usia. Di Indonesia, penelitian mengenai binge eating tergolong jarang sehingga belum bisa menggambarkan prevalensi binge eating secara general. Tujuan penelitian ini yaitu untuk menganalisis hubungan harga diri, pembatasan makan, BMI, dan regulasi emosi terhadap perilaku binge eating. Penelitian ini menggunakan metode kuantitatif dengan study cross-sectional. Sampel dalam penelitian berjumlah 346 partisipan. Teknik pengumpulan data menggunakan kuesioner Modifikasi BES (Binge Eating Scale), DERS-SF (Difficulty Emotional Regulation – Short Form), RSES (Rosenberg Self Esteem Scale), dan Kuesioner pembatasan makan yang sudah diuji validitas dan reliabilitasnya. Hasil penelitian ini, menunjukkan bahwa terdapat hubungan yang signifikan antara binge eating dengan harga diri ($p=0,02$), regulasi emosi ($p=0,00$), dan pembatasan makan ($p=0,02$). Sementara pada analisis multivariat menunjukkan bahwa pembatasan makan memiliki hubungan paling kuat ($p=0,02$). Penelitian ini dapat disimpulkan bahwa regulasi emosi, harga diri, dan pembatasan makan menjadi faktor risiko perilaku binge eating dan pembatasan makan menjadi faktor yang paling kuat. BMI Z-score menunjukkan korelasi negatif terhadap kejadian binge eating pada remaja. Saran: Diharapkan kepada sekolah untuk dapat memberikan pendampingan secara emosional melalui bimbingan konseling pada siswa baik terkait kesehatan mental dan pengetahuan mengenai perilaku makan serta diet tepat.

Kata kunci: perilaku binge eating, remaja, faktor psikologis, pembatasan makan, BMI

INTRODUCTION

Binge eating behavior is characterized by a tendency to eat quickly, feelings of guilt and shame after eating. The symptoms includes eating food until feeling uncomfortable and even accompanied by feelings of nausea (“Diagnostic and Statistical Manual of Mental Disorders: DSM-5TM, 5th Ed.,” 2013). Individuals with binge eating behavior often eat alone because they are ashamed of their portion sizes. Binge eating behavior differs from binge eating disorder, where binge eating disorder is a permanent diagnosis after clinical assessment related to eating disorders allegedly derived from deviant eating behavior. In summary, binge eating behavior is antecedent to binge eating disorder (Cassidy et al., 2016). In addition to binge eating disorder, binge eating behavior is also closely related to bulimia nervosa and anorexia nervosa, which are eating disorders (Burton & Abbott, 2017).

Binge eating behavior is found to be shared among adolescents and has become a health problem, especially in adolescent nutrition with substantial physical and mental health impacts (Coffino et al., 2016; Kirkley et al., 1988). A recent community-based study conducted in Danish reported that the prevalence of adolescents with binge eating behavior reached 45% (Olsen et al., 2021). In addition, a population-based study showed that 452 (12.6%) young adolescents reported subclinical binge eating symptoms. Those who reported loss of eating control and binge eating exhibited compensatory primary behaviors (e.g., hiding or throwing away food, skipping meals) (Derks et al., 2022). About 13% of adolescents in the general population reported at least one episode of binge eating each week (Bentley et al., 2015). Binge eating behavior also tends to increase with age. This is evidenced through a 10-year longitudinal study-based research that showed the prevalence of binge eating behavior increased during adolescence to adulthood in females by 9.9% to 14.1% and in males by 3% to 5.9% (Neumark-Sztainer et al., 2011).

Binge eating behavior is frequently linked to several significant outcomes, including obesity, various chronic physical, and mental health issues, reduced quality of life, and impaired social functioning (Mason & Lewis, 2014). Meanwhile, adolescents who are obese are becoming more vulnerable to non-communicable diseases like hypertension, diabetes, cancer, stroke, cardiovascular disease, and gallbladder disease. According to data from 2018 national health survey, the prevalence of obesity in Indonesia was 19.8% in 2018 (Riset Kesehatan Dasar, 2018).

Previous research reported several factors that influence adolescents in experiencing binge eating behavior, including demographic factors such as gender, educational status, economic status, pathophysiological factors such as low self-esteem, the presence of depressive symptoms, difficulty in regulating emotions, unhealthy diet habits such as restrictive eating or food addiction, nutritional status and also a high increase in suicide risk compared to adolescents who do not have binge eating behavior (Ackard et al., 2003; Burton & Abbott, 2019; Mustelin et al., 2017).

Low self-esteem is a psychological condition characterized by a negative or diminished view of oneself. People with low self-esteem tend to have a poor self-image and often harbor feelings of inadequacy, self-doubt, and self-criticism. Low self-esteem has been widely researched to have a positive relationship with binge eating behavior (Dovey, 2016). A study conducted by Stice et al. (2017) has analyzed various risk factors for binge eating behavior, with one of them being low adolescent self-esteem, and the study concluded that low self-esteem could predict the onset of binge eating behavior among adolescents. In a recent study, it was found that the symptomatology of binge eating behavior was positively associated with low self-esteem (Cella et al., 2021; Stice et al., 2017).

The inability of adolescents to effectively manage their emotions is a factor that correlates with an increased likelihood of engaging in binge eating behavior. When negative emotions are not appropriately regulated, it can contribute to unhealthy behaviors, particularly during the adolescent years (da Luz et al., 2023a). During adolescence, they tend to learn to understand and process their emotional and psychological states independently. When individuals struggle to effectively manage their emotions, especially negative ones like stress, sadness, or anxiety, they may turn to binge eating to cope with or temporarily numb their feelings. Binge eating can provide comfort or distraction from emotional distress, but it often leads to feelings of guilt, shame, and further emotional turmoil afterward (Baigrie & Giráldez, 2008). Research suggests that difficulties in emotion regulation are linked to binge eating behavior. Inefficient mechanisms of emotional regulation appear essential in understanding the development and maintenance of binge eating (Walenda et al., 2021).

Dietary restraint is defined as a form of conscious eating restriction for weight control (Coffino et al., 2016). In some theories and research models, dietary restraint is a significant risk factor for binge eating behavior, which is also closely related to the incidence of eating disorders. Dietary restraint has long been considered a predictor of the onset and maintenance of binge eating, particularly in individuals who unsuccessfully attempt to restrict intake (Johnson et al., 2012). In addition, individuals who try to do dietary restraint give themselves excessive rewards, indirectly leading to binge eating behavior (Linardon, 2018). Research on non-clinical samples reported that individuals who practice dietary restraint tend to have more significant binge eating behavior than those who do not (Burton & Abbott, 2019). In a variety of ways, dietary restraint can lead to binge eating. Dieting, for example, may reduce caloric intake. Usually, the majority of adolescents start diets without having a solid understanding of how to implement it, even though the goal of dieting is usually to lose weight, misapplied dieting patterns can lead to binge eating behaviors. This post-diet behavior has the paradoxical effect of causing one to fail to lose or even gain weight subconsciously (Cubic, 1993; Kirkley et al., 1988; Stewart et al., 2022).

In Indonesia, research on binge eating is still rare, so it cannot provide a comprehensive picture of the prevalence of binge eating. Local research conducted by Kusbiantari et al. (2020) in Semarang City indicated that binge eating behavior was found in approximately 11.03% of the population (7.78% in adolescent girls and 4.16% in adolescent boys) (Kusbiantari et al., 2020). Therefore, in this study, the researchers aimed to identify factors that influence binge eating behavior, such as self-esteem, dietary restraint, body mass index (BMI) z-score, and emotion regulation in high school students in the central area of Semarang City.

METHOD

Participant characteristics and research design

This study is a cross-sectional study that uses a research design with a quantitative approach. This study was conducted in the central region of Semarang city in 2023.

The independent variables in this study are BMI, emotion regulation, self-esteem, and dietary restraint. Meanwhile, the dependent variable is binge eating behavior.

Sampling procedures

The population in this study is adolescents (15-18 years), which amounted to 9604 people in the Semarang City Region. The sampling technique in this study used Probability Sampling with Stratified Random Sampling technique. The population in this study is spread into 17 public/private high schools. Prior to sample selection, first matching is done to control confounding variables in this study based on sample requirements or criteria. The inclusion criteria in this study include 1) High school students in Semarang City, 2) Healthy, and 3) Willing to be a research respondent, while the exclusion criteria are having a history of chronic disease.

Sample size, power, and precision

In this study, the sample taken was 25% of the population. Therefore, the school sample obtained is $25\% \times 17 = 4.25 \approx 4$ units. Based on the sample calculation, using the binomunal proportional formula, the minimum sample size in this study was 341.1 samples which were rounded up to 341 samples.

Measures and covariates

The Ethics Committee approved this research for Health Research, Faculty of Medicine, Semarang State University No. 345/KEP/EC/2023. Data were collected using a questionnaire. Information related to subject characteristics, including age, gender, history of chronic disease, weight, and height, were included in the questionnaire. Filling in the questionnaire was done through self-report, except for filling in height and weight. Body weight and height were measured directly using digital scales and microtome.

Binge eating is measured using a questionnaire adapted and modified from the BES, which is a self-report instrument that measures cognitive/emotional and behavioral symptoms related to binge eating. This questionnaire contains 12 items, each consisting of 4 Likert scales, namely never, sometimes, often, and always with a score of 1-4. The higher the score, the greater the tendency of binge eating behavior. The cut-off on this instrument is 24. The scale has also been shown to have good reliability and validity. The scale used within this study showed good internal consistency (Cronbach's $\alpha = 0.76$).

The Rosenberg Self-Esteem Scale is a questionnaire that has been widely used to measure self-esteem (Alwi & Razak, 2022). This questionnaire contains 9 items with a 4-point Likert scale. The options 'strongly agree' are scored 4, 'agree' is scored 3, 'disagree' is scored 2, and 'strongly disagree' is scored 1. The total achievable score on the scale ranges between 0 and 36. Higher scores indicate higher levels of self-esteem. The RSES has a Cronbach alpha value of 0.82. The cut-off on this instrument is 18.

Difficulties Emotional Regulation Short Form (DERS-SF) is a short form of the Difficulties Emotional Regulation (DERS) questionnaire. This questionnaire consists of 11 self-report items that are well-validated and widely used to assess adolescent emotion regulation problems. The scale used is a Likert scale with the options 'strongly agree' scored 4, 'agree' scored 3, 'disagree' scored 2, and

'strongly disagree' scored 1. This questionnaire has a Cronbach alpha value of 0.80. The cut-off on this instrument is 22.

Dietary restraint was measured using a self-report questionnaire the author created to measure a form of dietary restraint adapted to the author's research needs. This questionnaire contained nine items, including 'I regulate the amount and type of food I eat,' 'I monitor my calories and portions,' 'I restrict my eating to lose/maintain my weight,' and others where each item consisted of 4 Likert scales namely never, sometimes, often, and always with a score of 1-4. The higher the score, the greater the tendency of restricted eating behavior. The cut-off on this instrument is 18. The scale has also been shown to have good reliability and validity. The scale used within this study showed good internal consistency (Cronbach's $\alpha = 0.73$).

Data analysis

Univariate analysis was used to describe the characteristics of subjects on each variable using descriptive statistics. Bivariate analysis was performed using the Chi-Square test to obtain the relationship of binge eating behavior with BMI, Emotion Regulation, Self-esteem, and Dietary Restraint with a significance of $p < 0.05$ and a 95% confidence level. In addition, logistic regression analysis was used to determine the most contributing factors to binge eating behavior. Only variables that yielded a p-value of less than 0.05 during chi-square analysis were selected for logistic regression analysis. The level of statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

This study aims to determine the determinants of binge eating behavior in the adolescent age group with 346 participants.

Characteristics	N	%
BMI		
Underweight	34	9,8
Normal	254	73,4
Overweight	40	11,6
Obese	18	5,2
Binge Eating Behavior		
Yes	118	34,1
No	228	65,9
Dietary Restraint		
Yes	170	49,1
No	176	50,9
Emotion Regulation		
Difficult	267	77,2
Normal	79	22,8
Self Esteem		
High	329	95
Low	17	5

Table 1. Characteristics of Subjects

BMI Body Mass Index

Table 1. shows the characteristics of the subjects. Of the total 346 participants, the prevalence of adolescents with binge eating behavior was 118 (33.5%), with the majority experienced by adolescent girls. The mean BMI in the z-score is -0.34 (normal). Emotion regulation scores in the difficult category amounted to 267 (77.2%), while the score category in the non-difficult category of emotion regulation amounted to 79 respondents (32.8%). This shows that respondents essentially have

difficulties in regulating their emotions. In the self-esteem score, overall, adolescents have a good self-esteem score where participants with high categories amounted to 329 respondents (95%) and low self-esteem score categories amounted to 17 respondents (5%). Furthermore, dietary restraint showed a high value where half of the participants had a habit of doing food restriction, as shown in the score of 49.1%, while those who did not were 50.9%.

Independent Variable	Binge Eating Behavior				Total		P-Value
	Yes		No				
	n	%	n	%	n	%	
BMI							
Underweight	10	29,4	24	70,6	34	100	0,41
Normal	90	35,4	164	64,6	254	100	
Overweight	10	25	30	75	40	100	
Obese	8	44,4	10	55,6	18	100	
Independent Variable	Binge Eating Behavior				Total		P-Value
	Yes		No				
	n	%	n	%	n	%	
Dietary Restraint							
Yes	68	40	102	60	170	100	0,02*
No	50	28,4	126	71,6	176	100	
Regulation Emotion							
Difficult	106	39,7	161	60,3	167	100	0,00*
Normal	12	15,2	67	84,8	79	100	
Self Esteem							
High	108	32,8	221	67,2	329	100	0,02*
Low	10	58,8	7	41,2	17	100	

Table 2. Cross tabulation of BMI, Dietary Restraint, Emotion Regulation, Self Esteem on Binge Eating Behavior

Notes: BMI = Body Mass Index

* $p < .05$.

It was found that BMI was not found to have a positive correlation with binge eating behavior, as shown in the significance value ($p=0.413$). It was found that almost all participants with binge eating behavior had difficulties in regulating their emotions (89.8%, $n=267$). The binge eating behavior score significantly increased in participants who had difficulty in regulating their emotions compared to those who had stable emotion regulation. Based on chi-square analysis, a positive association was found between binge eating behavior and difficulty in emotion regulation ($p=0.000$).

Furthermore, high self-esteem was found in participants with binge eating behavior, and the majority of participants showed stable self-esteem. The score of binge eating behavior has a positive correlation with participants' self-esteem based on chi square analysis test with significance value ($p=0.027$). Furthermore, more than half of the participants with binge eating behavior had dietary restraint (57%, $n=106$). The binge eating behavior score showed a higher rate in participants who had dietary restraint compared to those who did not have dietary restraint. In addition, based on chi-square analysis, a positive correlation was found between the two variables, as evidenced by the significant value ($p=0.023$).

Independent Variable	B	S.E	Wald	P-Value	Exp(B)	CI 95%	
						Lower	Upper
Emotional Regulation	0.362	0.285	1.613	0.204	1.436	0.821	2.512
Self Esteem	-0.701	0.591	1.408	0.235	0.496	0,156	1/579
Dietary Restraint	0.519	0.231	5.060	0.024	1.681	1.069	2.643

Table 3. Multivariate Analysis

Based on table 3. It can be seen that the dietary restraint variable has the most substantial relationship to the occurrence of binge eating behavior in adolescents, as evidenced by the significance value of $p = 0.0496$ and $\beta = 0.519$.

DISCUSSION

The results of this study are significant as they show that binge eating behavior, which is associated with overeating in a short period of time, can be seen in the adolescent population in the Semarang City area. The prevalence of binge eating behavior observed in this study is inline. It varies (33.5%), with the prevalence in various parts of the world in the range of 3.8-45% observed in adolescents in the United States, Danish and several countries in Asia such as South Korea and Malaysia (Gan et al., 2018; Jung et al., 2017; Lee-Winn et al., 2018; Olsen et al., 2021). This variation in prevalence may be due to cultural differences in each country that influence adolescents' dietary patterns. In addition, the fact that our results differed slightly from some reported incidences could be due to the limited sample size. In addition, the calculations in this study were based on the use of a survey scale, and none of the participants underwent a clinical interview, which could be a cause of bias in this study.

Based on the study's results, female adolescents are more likely to experience binge eating behavior than male adolescents. These results are in line with research conducted on the prevalence of "any binge eating," which is roughly comparable in women (4.9%) and men (4.0%) (Striegel-Moore et al., 2009). In addition, longitudinal studies show that the prevalence of binge eating is more common in females than males, with 2.3% to 3.1% of females and 0.3% to 1.0% of males reporting binge eating between the ages of 16 and 24 years (Sonnevile et al., 2013). This may be due to different food preferences and eating styles between men and women. In addition, women are more likely than men to experience brain activity related to negative body perception (Barakat et al., 2023). Numerous women embark on diets to achieve a slender physique, although, in many instances, this goal may still need to be met due to biological factors. Substantial evidence supports a cause-and-effect relationship between fasting and subsequent episodes of excessive eating (Tuschl, 1990). One possible reason for this discovery might be that men were less inclined to disclose their binge eating habits, as it was considered less socially acceptable and unusual for males to share their emotions openly (Gan et al., 2018).

Binge Eating Behavior With BMI

In the current study, the increased BMI was more significant in adolescents without binge eating behavior than in adolescents with binge eating behavior. This study contradicts previous research, which states that the increase in BMI is directly proportional to the habit of binge eating behavior, which is caused by a negative body image perspective due to pressure on the social environment (Yan et al., 2023). The difference in this study is due to the characteristics of participants, the majority of whom have a normal BMI Z-Score, so weight gain or loss cannot be used as a precursor to the incidence of binge eating behavior in adolescents. An individual's tendency to binge eat may be determined by BMI (Černelič-Bizjak & Guiné, 2022). However, it is also followed along with other accompanying risk factors, such as, for example, in previous studies stating that depressive symptoms are one of the risk factors for binge eating behavior that can be experienced with or without obesity (Mason & Lewis, 2014). This study is also in line with research conducted on students in Semarang, which states that binge eating is also seen in individuals with normal weight (Kusbiantari et al., 2020).

Binge Eating Behavior With Emotion Regulation

"Emotion regulation" refers to managing, controlling, or modifying one's emotional responses to adapt to different situations, cope with stress, or achieve specific goals. It involves strategies and techniques that individuals use to influence their emotions, such as calming themselves down when feeling angry or increasing their enthusiasm when facing a challenge. Emotion regulation is an essential aspect of emotional well-being and effective social functioning (Salimzadeh et al., 2021).

Adolescents tend to have high levels of emotionality that are frequent, intense, and unstable compared to adults and children (Kwilas et al., 2015). This is evidenced by the results of this study, which show that overall, male and female adolescents have difficulties regulating their emotions. Participants needed help in recognizing and validating the feelings they felt. In line with this research, an Italian study reported that binge behavior in both food and alcohol had a strong relationship with adolescents' ability to regulate their emotions (Laghi et al., 2018). In addition, an experimental study found increased food consumption in samples with negative emotions (Walenda et al., 2021). The more difficult it is for adolescents to regulate their emotions, the more likely they are to experience binge eating behavior.

Financially disadvantaged families, genetic factors affecting weight, physical dissatisfaction, and reliance on external standards may be factors that increase the likelihood of binge episodes (Ahmed et al., 2015). Under these circumstances, they tend to use food as a focus of attention and seek to find emotional solace through overeating. In addition, binge eating behavior may provide an opportunity for them to release anger or stress, providing a temporary escape for those who feel bored or lonely (Simpson et al., n.d.). Their capacity to manage or regulate emotions in an appropriate and socially adaptive manner has been recognized as a significant risk factor in binge eating (Joseph et al., 2023)

Binge Eating Behavior With Self-Esteem

Self-esteem is a concept that can be defined as a positive or negative view individuals have of themselves, and it operates as an emotional assessment of their self-worth (Rosenberg). The current study shows a unique finding that adolescents with high binge eating behavior tend to have high levels of self-esteem. These results contradict most studies that discuss self-esteem with deviant eating behaviors, such as binge eating (Gitau et al., 2014). Low self-esteem is recognized as a psychological factor influencing body image disturbance (Della & Yudiarto, 2021). Other research suggests that lower levels of self-esteem are a significant contributor to predicting a negative body image (Paxton & Phythian, 1999). This is supported by a study stating that low self-esteem is a risk factor for binge eating behavior caused by the tendency of participants with low body image to affect their level of self-confidence (Tamhane, 2017). Later studies of education-based school programs focused on improving self-esteem have shown positive effects on body image and long-term changes in body-related perceptions and attitudes (Norwood et al., 2011).

One factor that may explain the different results in this study is that people who successfully control their diet and achieve short-term benefits may develop confidence in their own abilities, which in turn may increase feelings of self-worth (Sehm & Warschburger, 2018). Some individuals with high self-esteem may use binge eating as a way to cope with negative emotions or stress. They might have a strong sense of self-worth but still struggle with emotional regulation, leading to binge eating as a coping mechanism (Cella et al., 2019). This is supported by the finding that binge eating symptomatology was associated with a lower level of self-esteem (Cella et al., 2021). However, some studies have found that students with high self-esteem are less likely to suffer from eating disorders, including binge eating (Pelc et al., 2023). It is important to note that the relationship between self-esteem and binge eating is complex and may depend on various factors.

Binge Eating Behavior With Dietary Restraint

This study found a positive relationship between adolescents with dietary restraint habits and increased binge eating behavior. This statement is linear with cross-sectional studies, which state that individuals who exercise control over eating patterns where the individual will pay attention to food intake and try to fight physiological processes such as sensations of hunger and satiety (Stewart et al., 2022). Adolescents in this study tended to skip breakfast and engage in dieting and portion control as

a way to maintain their weight and diet. It is also not uncommon for them to monitor their calorie and intake intake. However, based on the analysis conducted, it was found that in its application, they tend to focus only on the goals they want to achieve rather than paying attention to whether the diet is appropriate. This can lead to a state of deprivation, which can trigger binge eating as a way to compensate for the perceived lack of food. When individuals feel deprived of certain foods or calorie intake, it can create a strong desire for those restricted items (Tuschl, 1990).

Binge eating behavior in adolescents who are on dietary restraint can be influenced by several other factors, such as psychological factors (Goldschmidt et al., 2012). People on a controlled diet are less likely to experience decreased self-control when they encounter stressors, whether they come from external factors such as social pressures or life problems or internal factors such as negative feelings about themselves (Dovey, 2016; Kukuk & Akkermann, 2022; Yau & Potenza, 2013). In stressful situations, the urge to vent through food is often more vital, and this can interfere with self-control in adhering to a healthy diet or moderating food intake. This is one-way stress can contribute to the emergence of unhealthy eating behaviors, including binge eating (Yau & Potenza, 2013). Understanding the relationship between dietary restraint and stress may help individuals develop more effective strategies to cope with stress without relying on food (Cubic, 1993).

Most Influential Factors On Binge Eating Behavior

Based on the results of multivariate analysis using logistic regression, dietary restraint shows the most significant influence on binge eating behavior in adolescent groups. This can occur because dietary restraint variables tend to have a direct relationship to binge eating behavior experienced by adolescents compared to other variables, as evidenced by the high beta value ($\beta=0.519$).

Dietary restraint primarily involves the intention to limit food intake and does not necessarily involve actual weight loss or mandatory weight control methods. However, if there is a causal relationship between restrained eating and binge eating, this should also be attributed to long-term changes in daily eating habits (Jiang, 2021). These changes are the cause of the inability to stop eating in time after cognitive control is lost, which ultimately leads to episodes of binge eating. Short-term periods of physiological deprivation resulting from intermittent caloric restriction can be expected in individuals on restriction and can potentially trigger binge eating, especially among adolescents (Tuschl, 1990).

LIMITATION OF THE STUDY

This study has several limitations. Due to its cross-sectional nature, this study could not identify cause-and-effect relationships between the variables studied. Furthermore, some critical data in this study were self-reported. However, despite these limitations, one of the advantages of this study is that the researcher directly weighed and measured each participant's height, thus providing more accurate information than the self-report method. In addition, there are determinant factors that are not included in the focus of this study, some of which are economic status, sedentary lifestyle, and food consumption levels, which in some studies show a meaningful relationship and can enrich the researcher's research.

CONCLUSIONS AND SUGGESTIONS

There was a positive correlation between binge eating behavior with low emotional regulation, high self-esteem, and adolescents' dietary restraint habits. The findings on emotion regulation and dietary restraint are in accordance with most of the previous studies that examined this area. In addition, there was no positive correlation between binge eating behavior and BMI Z-Score because adolescents in this sample had a BMI Z-Score that tended to be expected, so it could not illustrate whether an

increase in BMI could be positively correlated in this study. Of the three variables that are positively correlated, dietary restraint has the strongest relationship. Schools can provide emotional assistance by conducting routine counseling through counseling guidance to students both related to mental health and knowledge about eating behavior and proper diet.

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ETHICAL CONSIDERATIONS

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Conflict of Interest Statement

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