Amerta Nutrition
e-ISSN: 2580-1163 (Online)
p-ISSN: 2580-9776 (Print)
Agestika and Ratnayani | Amerta Nutrition Vol. 7 Issue 1 (March 2023). 14-19

RESEARCH STUDY
English Version
OPEN ACCESS

Snacking Habits, Strict Diet, BMI, and Body Image of Adolescents in Three Sub-Districts in Depok and Bogor

Kebiasaan Jajan, Diet Ketat, Indeks Masa Tubuh dan Persepsi Body Image pada Remaja di Tiga Kecamatan di Depok dan Bogor

Lina Agestika*[1], Ratnayani Ratnayani[1]

[1]Nutrition Department, Faculty of Health Sciences and Technology, Binawan University, Jakarta, Indonesia

ARTICLE INFO

Received: *19-04-2022*
Accepted: *14-06-2022*
Published online: *03-03-2023*

Correspondent:
Lina Agestika
lina.agestika@binawan.ac.id

DOI:
10.20473/amnt.v7i1.2023.14-19

Available online at:
https://e-journal.unair.ac.id/AMNT

Keywords:
Body image, Strict diet, Body Mass Index, Snacking habit

ABSTRACT

Background: Body image is related to adolescent food preferences, which determine their nutritional status. Peri-urban areas might have different adolescents' snacking habits, strict diets, nutritional status, and body image.
Objectives: This study aimed to analyze the association between adolescents' snacking habits, implementation of a strict diet, and nutritional status on their body image.
Methods: This study used a mix-method, a combination of the quantitative and qualitative survey with a cross-sectional design. A total of 39 adolescents aged 15-18 who live in the peri-urban areas of Depok and Bogor were consecutively selected. The study was conducted in January 2022. Quantitative data include respondents' characteristics, body weight and height, snacking habits, and body image. Qualitative data collected were types of snacks, their reasons for buying snacks, and perceptions of ideal weight.
Results: The nutritional status of the respondents was underweighted (5%), normal (92%), and overweight (3%), with snacking frequency 4-7 times/week (59%) with a weekly snacking expenditure of IDR 15,000 – 30,000 (49 %). As many as 23% of respondents performed a strict diet and perceived having a thin (21%) and fat (23%) body image. Adolescents with normal nutritional status were perceived as having fat (20.5%) and thin (15.4%) body image (p: 0,0215). There was also a relationship between diet (p: 0.0084) and weekly snacking expenditure (p: 0.0152) with body image, and there was no relationship between snacking frequency (p: 0.3123) and daily meal frequency (p-value=0.3972) with body image.
Conclusions: A wrong perception of body image from actual nutritional status can affect snacking habits and the implementation of a strict diet among adolescents.

INTRODUCTION

The triple burden malnutrition problems were a concern in developing countries, including Indonesia. It was mentioned that a quarter of adolescents aged 13-15 years were short (25.7%), while adolescents aged 16-18 years were found to be very short (26.9%)[1]. Further, 8.7% of adolescents aged 13-15 and 8.1% aged 16-18 were thin and very thin. The prevalence of overweight and obesity among adolescents aged 13-15 and 16-18 were 16.0% and 13.5%, respectively[2].

Malnutrition among adolescents was driven not only by communicable and non-communicable diseases, economic growth, inadequate child care, and dietary intake but also by their psychosocial and psychological factors[3]. Body image is one of the factors related to adolescent food preference consumption, thus, indirectly affecting their nutritional status[4]. Social media usage, for instance, *Instagram, Facebook, WhatsApp* group, etc., could mediate their perception of body image[5].

Previous studies in Indonesia showed that more than 50% of adolescents are satisfied with their physical appearance[6]. Body image dissatisfaction was experienced by most overweight and obese girls. However, it does not mean boys never feel dissatisfied with their body image. Further, many studies explored the associated factor on adolescent body image dissatisfaction, such as moderate and vigorous physical activity, high screen time, increased alcohol consumption, and excess body fat[7]. The previous study also mentioned psychological factors such as loneliness, depression, general anxiety, and social anxiety as determinants[8]. However, their perception of body image often does not linearly match their current Body Mass Index (BMI)[4].

Both overestimation and underestimation of self-perceived body image were highlighted in a previous study in Brazil[9]. Prolonged dissatisfaction with their body image increases the risk for common mental disorders. However, the association between BMI their self-perceived body image among adolescents has rarely been explored, especially on its effect on implementing strict dieting and snacking.

How to cite: *Agestika, L., & Ratnayani, R. Snacking Habits, Strict Diet, BMI, and Body Image of Adolescents in Three Sub-Districts in Depok and Bogor: Kebiasaan Jajan, Diet Ketat, Indeks Masa Tubuh dan Persepsi Body Image pada Remaja di Tiga Kecamatan di Depok dan Bogor. Amerta Nutrition, 7(1), 14–19.*

The adolescent has begun to experience many physical and psychological changes. Their physical appearance becomes a concern. It has also been a significant contribution to fostering self-confidence. This condition made their perception of body image on themselves the crucial factor. Most teenagers wanted to be thinner when they suffered from Body Image Dissatisfaction (BID) since their body mass index (BMI) strongly correlated eight times with eating habits and performing an unhealthy strict dieting[10]. Unfortunately, the dieting practice was not followed with an adequate nutrient requirement calculation, leading to malnutrition. Limiting or refusing food intake, voluntarily having long-term fasting, intentionally consuming diet pills, appetite suppressants or laxatives, or even vomiting on purpose were shortcuts[4].

Most (52.4%) adolescents often consumed unhealthy snacks during screen time, such as watching tv or playing computer[11]. The snacks were processed foods with high saturated fat, sugar, and sodium or street food vendors. On the contrary, snacks containing vegetables and fruits were consumed less. Unfortunately, it was not followed with their physical activity. Further, excessive food additives consumption in processed food was unsafe for adolescent health. A previous study also mentioned that hazardous materials snacks that were not suitable for consumption; could affect their organ development and growth[12]. This trend in the urban area of Jakarta has been studied, but peri-urban such as Depok and Bogor have yet to be confirmed. Therefore, this study aimed to analyze BMI, snacking trend, and socioeconomic factors in self-perceived body image among adolescents in Indonesia.

METHODS

This study was a cross-sectional with mixed methods conducted among adolescents 15-18 years old in Depok and Bogor, Sawangan, Cileungsi, and Sukmajaya sub-district in January 2022. The total respondents were 39 adolescents purposively selected to live in study sites. Quantitative data include respondents' characteristics (gender, age, participants' residence), body weight, and body height to calculate BMI, parents' income, weekly snacks expenditure, weekly snacking frequency, dieting practice, and self-perception of body image. Snacking behavior in this study was defined as 1) weekly snack purchasing (1-3 times per week and 4-7 times per week); 2) weekly snacking expenditure of 5,000-15,000 IDR, 15,000-30,000 IDR, and more than 30,000 IDR). Further, a strict diet was coded if adolescents purposely lost weight by limiting their food intake and/or consuming diet pills/slimming tea or herb. Body weight and height were asked based on their latest measurement. Their self-perception of body image was using the presented image, A to E were underweight to highly obese (Figure 1). Picture A was thin; B was normal, C was overweight, D was obese, and E was very obese. Nutritional status was determined using the Ministry of Health z-score for adolescents aged 15-19 years old[13].

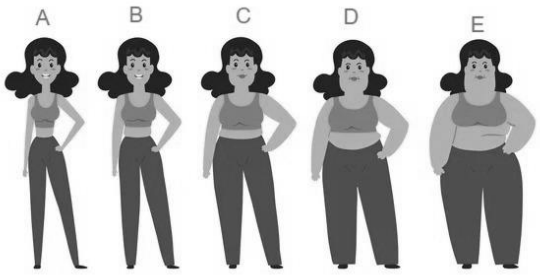

Figure 1. Body image perception

Qualitative data collected were types of snacks, their reasons for buying snacks, and perceptions of the ideal weight. Adolescents were asked to complete all open and closed questionnaires through an access link sent to each respondent. Statistical analysis is univariate and bivariate analysis. The bivariate analysis identified the association between nutritional status, performing diet, snack expenditure, snack consumption frequency, and parents' income with their perception of body image. The statistical analysis for these was the chi-square test.

Furthermore, the Oneway Anova test was used to analyze the association between BMI and body image. Statistical analysis with a p-value less than 0.05 was considered significant. The quantitative analysis was performed using JMP from SAS 16.0 software. The qualitative data aim to enrich and confirm the quantitative data. Their explanation regarding the types of snacks and reason for choosing snacks was then coded and grouped to emphasize their tendency to consume unhealthy snacks. Further, the qualitative data on their ideal weight was supposed to support their perception of performing a strict diet to maintain their ideal body.

RESULTS AND DISCUSSION

Participant characteristics are shown in Table 1. The proportion of boys and girls was 21% and 79%. Most lived in Bogor (56%) with an average age of 16.6 ± 0.88 years. In general, the nutritional status was normal. BMI ranged from 14,6-28,8. Underweight and overweight were 5% and 3%, respectively. More than half of them frequently consumed snacks (59%) and expended 15,000-30,000 IDR (41%). Twenty-three percent of them performed a strict diet and perceived having a thin (21%) and fat (23%) body image.

The bivariate analysis showed that participants' BMI significantly differed among adolescents with self-

How to cite: *Agestika, L., & Ratnayani, R. Snacking Habits, Strict Diet, BMI, and Body Image of Adolescents in Three Sub-Districts in Depok and Bogor: Kebiasaan Jajan, Diet Ketat, Indeks Masa Tubuh dan Persepsi Body Image pada Remaja di Tiga Kecamatan di Depok dan Bogor. Amerta Nutrition, 7(1), 14–19.*

perceived body image (p-value < 0.0001). Participants who perceived having a thin body image had the lowest BMI (16.9 ± 21.6 kg/m^2), normal body image had a BMI of 20.1 ± 2.5 kg/m2, while those who perceived being overweight had a BMI of 23.3 ± 3.1 kg/m^2. All group was still in the normal BMI range (20.2 ± 3.25 kg/m^2). This result shows that adolescents might have overestimated their nutritional status even if they know their body weight and height. Some were perceived as having a thin or fat body image, even though their nutritional status was normal. This gap could affect adolescent food consumption behavior.

Based on chi-square test analysis, significant associations were observed between performing a strict diet and snacking expenditure with self-perceived body image (p-value<0.05). Other variables, such as snacking and daily meal frequency, were insignificant (Table 3). Medium (3,000,000 IDR-5,000,000 IDR) to high (>5,000,000 IDR) parents' income tends to have a higher proportion to medium (15,000 IDR-30,000 IDR) weekly snacking expenditure (35.9%).

Table 1. Participant characteristics

Variable	n	%
Gender		
Boy	8	21
Girl	31	79
Location		
Depok	17	44
Bogor	22	56
Nutritional Status		
Underweight	2	5
Normal	36	92
Overweight	1	3
Snacking Frequency		
1-3 times	16	41
4-7 times	23	59
Snacking Expenditure		
5.000-15.000 IDR	8	21
15.000-30.000 IDR	16	41
>30.000 IDR	15	38
Parents income		
< 3.000.000 IDR	6	15
3.000.000-5.000.000 IDR	19	49
>5.000.000 IDR	14	36
Dieting		
Yes	9	23
No	30	77
Daily meal frequency		
Once	4	10
Twice	21	54
Three times	14	36
Body image		
Thin	8	21
Normal	22	56
Overweight	9	23

A study on adolescent snacking habits in Indonesia, especially in urban areas, has been explored[14]. A review article has also described the snacking habits in Indonesia[15]. This study analyses the relationship between snacking habits and strict diet on adolescent body image. The majority of adolescents overestimate their body image[9,10]. In this study, about 20.5% of adolescents with normal nutritional status perceived that they were fat. The result shows that 20.5% and 15,4% of adolescents with normal nutritional status were perceived as having overweight and thin body image, respectively. 56.4% of those having normal nutritional status perceived a normal body image (Image code B), and 3% of those overweight perceived it as fat. The statistical analysis results in Table 2 supported this finding. The average BMI among adolescents with a body image of thin, normal, and overweight was lower than the references of nutritional status for a thin and overweight adolescent (Table 2). This finding is consistent with a study in Brazil; 66% of students had a match perception of body image

How to cite: *Agestika, L., & Ratnayani, R. Snacking Habits, Strict Diet, BMI, and Body Image of Adolescents in Three Sub-Districts in Depok and Bogor: Kebiasaan Jajan, Diet Ketat, Indeks Masa Tubuh dan Persepsi Body Image pada Remaja di Tiga Kecamatan di Depok dan Bogor. Amerta Nutrition, 7(1), 14–19.*

with their actual weight[9]. Misinterpreting their body image may be due to their body preference and role models such as artists, models, and other public figures. The intended use of social media can facilitate this process[16].

These inappropriate self-perceived body images have led to a strict diet and snacking expenditure, but not to its frequency (Table 3). Adolescents who perceived themselves as overweight to obese tend to perform a strict diet and limit their weekly snacking expenditure. Self-perceived body image had been demonstrated to correlate with eating habits and lead to thinness and social physique anxiety[4]. Lowering meal frequency and skipping breakfast were common[4]. They also consume fewer snacks such as cakes, candies, and chocolates[4]. This result agreed with our finding that those who considered themselves fat had lower snacking expenditure. Change in their snacking frequency might also occur due to the pandemic. A previous study stated that before and during the pandemic, the snacking habit among adolescents decreased by more than 50%[17]. However, no association was found between self-perceived body image with daily meal frequency.

Table 2. Body mass index differences among adolescent's self-perceived body image (n=39)

Variable	Mean ± SD	p-value*
Body Image		
Thin	16.9 ± 1.6	<0.0001
Normal	20.1 ± 2.5	
Overweight	23.3 ± 3.1	

*Oneway anova; significance at p-value <0.05

Table 3. Association of adolescent's nutritional status, dieting, snacking habit, and daily meal frequency to adolescent's self-perceived body image (n=39)

Variable	Body Image			p-value*
	Thin	Normal	Overweight	
Nutritional Status				
Underweight	2 (5.1)	0	0	0.0215
Normal	6 (15.4)	22 (56.4)	8 (20.5)	
Overweight	0	0	1 (2.6)	
Dieting				
Yes	0	4 (10.3)	5 (12.8)	0.0179
No	8 (20.5)	18 (46.2)	4 (10.3)	
Weekly Snacking Frequency				
1-3 times	3 (6.7)	8 (20.5)	5 (12.8)	0.5993
4-7 times	5 (12.8)	14 (35.9)	4 (10.3)	
Snacking Expenditure				
5,000-15,000 IDR	3 (7.7)	3 (7.7)	2 (5.1)	0.0327
15,000-30,000 IDR	2 (5.1)	7 (17.9)	7 (17.9)	
>30,000 IDR	3 (7.7)	12 (30.8)	0	
Daily meal frequency				
Once	0	2 (5.1)	2 (5.1)	0.5663
Twice	4 (10.3)	13 (33.3)	4 (10.3)	
Three times	4 (10.3)	7 (17.9)	3 (7.7)	

*Chi-square test; significancy at p-value<0.05

Adolescents' common perception about the justification of healthy that thin is beautiful has encouraged adolescents and young adults unconsciously to form a strict diet[18]. A well-proportioned body size is considered more attractive. Thus, limiting snacking, consuming fruits and vegetables, and exercising was a way to achieve them. This linear to some comments from the study participants that stated:

"By consuming more vegetables and fruits, as called a balanced nutrition, and doing sport, I think I can maintain my ideal body."

The participants have various nutritional statuses. Some of them had less BMI concerned with increasing body weight, as mentioned:

"My body weight seems to be underweighted, so I think I should eat more portion of food."

However, many of them also replied that:

"I do not really care about my body weight."

Adolescents in Indonesia often consume traditional and modern snacks provided in convenience

How to cite: *Agestika, L., & Ratnayani, R. Snacking Habits, Strict Diet, BMI, and Body Image of Adolescents in Three Sub-Districts in Depok and Bogor: Kebiasaan Jajan, Diet Ketat, Indeks Masa Tubuh dan Persepsi Body Image pada Remaja di Tiga Kecamatan di Depok dan Bogor. Amerta Nutrition, 7(1), 14–19.*

stores and street food vendors[14]. It helped them to fill between meals time or to decrease boredom. The affordable and tasty snack was preferable. It is linear to our study, with 67% of them preferring to buy their snack because of the taste, 18% of them considered the price, and 15% considered the nutrient and calorie content. Instant noodles, *bakwan*, candies, and western fast food were considered preferable by another study conducted in Indonesia[14]. However, this study showed that traditional ones were preferable among peri-urban adolescents. From an interview, 18 of them often consumed *seblak*, meatball, and *sempol ayam*; 6 of them often consumed Indonesian *aci* (tapioca flour) products such as *cimin, cilok, cimol, basgor, cireng*; 5 of them preferred to have bread as snacks, while only one person liked fast-food such as burger and fried chicken. Further, 8 of them often consumed sweetened beverages such as boba milk, coffee, and *Cappuccino cincau*.

CONCLUSIONS

The evidence in this study provides the recent trend among Indonesian peri-urban adolescent snacking habits, dieting, and self-perceived body image. Half of the adolescents had a match of self-perceived body image, while the rest considered themselves thin or fat. Their self-perceived body image is associated with a strict diet they performed and snacking expenditure. In contrast, snacking and meal frequency had no association with body image. In other words, young adolescents tend to overestimate or underestimate their body weight which could affect their eating habits. A simple education on BMI calculation among adolescents might help them to conquer this

ACKNOWLEDGEMENT

Special acknowledgment to our beloved student Diandra Safira and the team from Nutrition Study Program at Binawan University. We also feel grateful to all study participants involved in this study.

Conflict of Interest and Funding Disclosure

All authors have no conflict of interest in this article. This study was independently funded.

REFERENCES

1. The Ministry of Health of Indonesia. *Baseline Health Research 2018*. *Kementerian Kesehatan RI* (2018) doi:978-602-8937-24-5.
2. The Ministry of Health. Gizi saat Remaja Tentukan Kualitas Keturunan. https://www.kemkes.go.id/article/view/20012600004/gizi-saat-remaja-tentukan-kualitas-keturunan.html (2020).
3. Manerkar, K., Gokhale, D. & Sheikh, F. The Effect of Psychosocial Factors on Eating Behaviors among University Students. *Ind J Youth Adol Health* **3**, 5–11 (2016).
4. Jankauskiene, R. & Baceviciene, M. Body Image Concerns, and Body Weight Overestimation Do Not Promote Healthy Behaviour: Evidence from Adolescents in Lithuania. *International Journal of Environmental Research and Public Health* **16**, (2019).
5. Añez, E. *et al.* Body Image Dissatisfaction, Physical Activity and Screen-Time in Spanish Adolescents. *Journal of Health Psychology* **23**, 36–47 (2018).
6. Niswah, I., Rah, J. H. & Roshita, A. The Association of Body Image Perception With Dietary and Physical Activity Behaviors among Adolescents in Indonesia. *Food and Nutrition Bulletin* **42**, S109–S121 (2021).
7. Miranda, V. P. N. *et al.* Body Image Disorders Associated with Lifestyle and Body Composition of Female Adolescents. *Public Health Nutrition* **24**, 95–105 (2021).
8. Yurdagül, C., Kircaburun, K., Emirtekin, E., Wang, P. & Griffiths, M. D. Psychopathological Consequences Related to Problematic Instagram Use Among Adolescents: The Mediating Role of Body Image Dissatisfaction and Moderating Role of Gender. *International Journal of Mental Health and Addiction* **19**, 1385–1397 (2021).
9. Moehlecke, M., Blume, C. A., Cureau, F. V., Kieling, C. & Schaan, B. D. Self-perceived Body Image, Dissatisfaction with Body Weight and Nutritional Status of Brazilian Adolescents: A Nationwide Study. *Jornal de Pediatria* **96**, 76–83 (2020).
10. Devaera, Y., Nasution, K. & Medise, B. Body Image Dissatisfaction and Its Impact on Healthy Eating Habits in Adolescents in Jakarta, Indonesia. *International Journal of Child and Adolescent Health; Hauppauge* **14**, 309–317 (2021).
11. Lisetyaningrum, I. & Pujasari, H. *A Cross-Sectional Analysis of Snacking Habits, Eating Habits, Physical Activity, and Indicators of Obesity Among High School Students in Jakarta, Indonesia*. *Journal of Public Health Research* vol. 10 (2021).
12. Laenggeng, H. & Lumalang, Y. Hubungan Pengetahuan Gizi dan Sikap Pemilihan Makanan Jajanan dengan Status Gizi Siswa SMP Negeri 1 Palu. *Jurnal Kesehatan Tadulako* **1**, 49–57 (2015).
13. The Ministry of Health of Republic Indonesia. *Peraturan Menteri Kesehatan Republik Indonesia No 2 Tahun 2020 tentang Standar Antropometri Anak*. 1–78 (2020).
14. Blum, L. S. *et al.* In-depth Assessment of Snacking Behaviour in Unmarried Adolescent Girls 16–19 Years of Age Living in Urban Centres of Java, Indonesia. *Maternal and Child Nutrition* **15**, (2019).
15. Rachmi, C. N., Jusril, H., Ariawan, I., Beal, T. & Sutrisna, A. Eating Behaviour of Indonesian Adolescents: A Systematic Review of The Literature. *Public Health Nutrition* (2020) doi:10.1017/S1368980020002876.
16. Ho, S. S., Lee, E. W. J. & Liao, Y. Social Network Sites, Friends, and Celebrities: The Roles of Social Comparison and Celebrity Involvement in Adolescents' Body Image Dissatisfaction. *Social Media and Society* **2**, (2016).
17. Dieny, F. F., Jauharany, F. F., Tsani, A. F. A. & Nissa, C. Perilaku Makan Sebelum dan Selama Pandemi Covid-19 pada Kelompok Remaja dan Dewasa di Indonesia. *AcTion: Aceh Nutrition Journal* **6**, 128 (2021).

How to cite: *Agestika, L., & Ratnayani, R. Snacking Habits, Strict Diet, BMI, and Body Image of Adolescents in Three Sub-Districts in Depok and Bogor: Kebiasaan Jajan, Diet Ketat, Indeks Masa Tubuh dan Persepsi Body Image pada Remaja di Tiga Kecamatan di Depok dan Bogor. Amerta Nutrition, 7(1), 14–19.*

18. Alim, N. E., Nur Beşler, Z., Çalışkan, G. & Göküstün, K. K. Assessment of the Relationship between Thinness Expectations, Body Satisfaction, and Eating Attitude and Behavior. *Amerta Nutr* (2021) doi:10.20473/amnt.v5i4.2021.

How to cite: *Agestika, L., & Ratnayani, R. Snacking Habits, Strict Diet, BMI, and Body Image of Adolescents in Three Sub-Districts in Depok and Bogor: Kebiasaan Jajan, Diet Ketat, Indeks Masa Tubuh dan Persepsi Body Image pada Remaja di Tiga Kecamatan di Depok dan Bogor. Amerta Nutrition, 7(1), 14–19.*