Body image and weight loss diet behavior are related to nutritional status in female college students

Citra tubuh dan perilaku diet penurunan berat badan berkaitan dengan status gizi pada mahasiswi

Zahra Zakiyah Komarudin[1], Prita Dhyani Swamilaksita[2*], Khairizka Citra Palupi[3], Harna[4], Dudung Angkasa[5]

[1] Department of Nutrition Science, Faculty of Health Sciences, Esa Unggul University, West Jakarta, Indonesia. E-mail: zakiyah167@gmail.com

[2] Department of Nutrition Science, Faculty of Health Sciences, Esa Unggul University, West Jakarta, Indonesia. E-mail: prita.dhyani@esaunggul.ac.id

[3] Department of Nutrition Science, Faculty of Health Sciences, Esa Unggul University, West Jakarta, Indonesia. E-mail: khairizka.tridharma@gmail.com

[4] Department of Nutrition Science, Faculty of Health Sciences, Esa Unggul University, West Jakarta, Indonesia.. E-mail: harna@esaunggul.ac.id

[5] Department of Nutrition Science, Faculty of Health Sciences, Esa Unggul University, West Jakarta, Indonesia.. E-mail: dudung.angkasa@esaunggul.ac.id

*Correspondence Author:
Department of Nutrition Science, Faculty of Health Sciences, Esa Unggul University, South Arjuna street 9th, Kebon Jeruk, West Jakarta, Indonesia. E-mail: prita.dhyani@esaunggul.ac.id

Abstract

Nutritional status is an important indicator of college student health. College students are included in the age group vulnerable to nutritional problems such as decreased diet quality and excessive weight. The study aims to determine the relationship between body image, mindful eating, and weight loss diet behavior with nutritional status in female college students. The study used a cross-sectional design and was conducted among female students at Esa Unggul University in 2022. A total of 122 subjects were selected using the Proportionate Stratified Random Sampling method. Nutritional status is measured by assessing Body Mass Index (BMI). The instruments used were the Multidimensional Body-Self Relations Questionnaire (MBSRQ) to assess body image, the Mindful Eating Questionnaire (MEQ) to assess mindful eating, and the dietary behavior questionnaire to assess weight loss. Data were analyzed by chi-square test at CI:95%. The results showed that body image was related to thin (p= 0,004) and obese (p= 0,000) nutritional status. Dietary behavior for weight loss is associated with thin nutritional status (p= 0,010) but not with obesity (p= 0,389). In conclusion, nutritional status (BMI) is related to body image and weight loss diet behavior in female college students.
Keywords: Body image, mindful eating, nutritional status, weight loss diet

Abstrak

Status gizi merupakan indikator penting pada kesehatan mahasiswa. Mahasiswa termasuk dalam kelompok umur yang rentan mengalami masalah gizi seperti penurunan kualitas diet dan berat badan yang berlebih. Penelitian bertujuan untuk mengetahui hubungan citra tubuh, *mindful eating*, dan perilaku diet penurunan berat badan dengan status gizi pada mahasiswi. Penelitian menggunakan desain *cross sectional,* dilakukan pada mahasiswi Universitas Esa Unggul tahun 2022. Subjek sebanyak 122 orang dipilih dengan metode *Proportionate Stratified Random Sampling*. Pengukuran status gizi dilakukan dengan menilai Indeks Massa Tubuh (IMT). Instrumen yang digunakan adalah *Multidimensional Body-Self Relations Questionnaire* (MBSRQ) untuk menilai citra tubuh, *Mindful Eating Questionnaire* (MEQ) untuk menilai *mindful eating*, dan kuesioner perilaku diet penurunan berat badan. Data dianalisis dengan uji *Chi-square* pada CI:95%. Hasil penelitian menunjukkan bahwa citra tubuh berhubungan dengan status gizi kurus (p= 0,004) dan gemuk (p= 0,000). Perilaku diet penurunan berat badan berhubungan dengan status gizi kurus (p= 0,010), namun tidak dengan gemuk (p= 0,389). Kesimpulan, status gizi (IMT) berhubungan dengan citra tubuh dan perilaku diet penurunan berat badan pada mahsiswa.
Kata Kunci: Citra tubuh, diet penurunan berat badan, *mindful eating*, status gizi

Introduction

Nutritional status is an important indicator of the age range of students. College students are prone to nutritional problems because the college years are a time of declining diet quality, which may play a central role in weight gain. In Indonesia, based on the results of the Basic Health Research of the Ministry of Health, people over the age of 18 who experience higher nutritional status reached 13,6% in 2018. This percentage increased from 2013, which was only 11,5%. Meanwhile, the percentage of obese people in this age group reached 21,8% in 2018, an increase from 13,8% in 2013, which ranged from 14,8% (Kementerian Kesehatan RI, 2018).

However, the nutritional problems currently faced are not only in terms of nutritional status but also undernutrition status, which is still relatively high in that age period. Nutritional status has less effect on a person's productivity and achievement. Nationally, adults over 18 years old who are underweight reach 5%, while in DKI Jakarta it reaches 4,3% (Kementerian Kesehatan RI, 2017).

One form of weight anxiety or weight concern mentioned by Cifuentes et al. (2022) is related to dissatisfaction about the body that affects eating behavior. Dissatisfaction with the body is a person's expression of body image, defined by Cash & Smolak (2012) as a multidimensional, subjective, and dynamic concept that includes perceptions, thoughts, and feelings about the body.

Habits that are often applied to solving weight problems are physical exercise, diet, consuming slimming products, fasting, and smoking (Rahamis et al., 2014). Cifuentes et al. (2022) said that controlling diet and food restriction behavior often results in binge eating or eating disorders that make individuals eat very large quantities of food and consider themselves to have no control over stopping eating.

The quality of eating can be reviewed based on self-awareness of eating activities that are being carried out, understanding the condition of hunger and satiety that is felt, and maintaining compatibility between the type of nutritious food consumed and the needs of each individual's body (Clementi, 2015). The eating behavior that Nelson (2017) calls mindful eating is an approach to food selection based on self-awareness and experience with food. Among female students, the understanding of the concept of mindful eating is still low, which is characterized by the habit of female students doing eating activities together with other activities or certain thoughts (Hilmia, 2020; Fayasari & Lestari, 2022).

Research in Indonesia on the relationship between body image, mindful eating, and weight loss diet behavior associated with nutritional status in female students is still limited. Meanwhile, in the age group of students, there is still a lack of understanding about healthy diet forms and enthusiasm to achieve an ideal body weight quickly. This has a bad impact on those who carry out unhealthy diet patterns without paying attention to the side effects they cause (Abdurrahman, 2014).

The study aims to determine the relationship between body image, mindful eating, weight loss diet behavior, and nutritional status in female students.

Methods

The type of research used is quantitative with a cross-sectional design, conducted in May 2022 at the Esa Unggul University Campus, Jakarta. The population in this study was female students at Esa Unggul University. The samples in this study were taken by proportionate stratified random sampling with a confidence level of 95% and an addition of 10% to avoid dropout, so the number of samples needed was 122 female students who met the inclusion criteria, including those aged 17 to 25 years and who were or had been on a diet to lose weight.

The data collected includes data on sample characteristics in the form of age, learning level, nutritional status, body image, mindful eating, and weight loss diet behavior. Nutritional status data is obtained from the results of weighing using digital weight scales. Height measurement using a microtoise. The body mass index (BMI) of respondents is categorized according to the Ministry of Health's P2PTM, namely thinness (<17,0–18,4), normal (18,5–25,0), and overweight (>25,1).

Data was collected by answering questionnaires in the form of a list of statements filled out by respondents themselves after being explained by researchers in the form of a self-identity questionnaire, a body image questionnaire (Multidimensional Body-Self Relations

Questionnaire) or MBSRQ developed by Oktaviani (2015), a mindful eating questionnaire (Mindful Eating Questionnaire) or MEQ developed by Hilmia (2020), and a weight loss diet behavior questionnaire developed by Safitri (2020).

The study began by collecting female students at Esa Unggul University who had or were on a weight-loss diet. Subjects who meet the criteria will be given research socialization and fill out informed consent as a form of willingness to become respondents. Then, anthropometric measurements of body weight using digital scales and height using a microtoise were carried out. Furthermore, a Google Form link was given containing a self-identity questionnaire, the Multidimensional Body Self-Relations Questionnaire (MBSRQ), the Mindful Eating Questionnaire (MEQ), and a questionnaire to assess weight loss diet behavior

Data processing and analysis begin with the processes of editing, coding, and data entry using a computer. Univariate data are presented in the form of frequency and percentage. Bivariate data were presented in the form of a quantitative table using the Chi-Square test with a value of $\alpha = 0,05$ to determine the relationship between body image, mindful eating, diet behavior, weight loss, and nutritional status.

This study used chi-square test analysis with a 2x2 table, where each variable consisted of two categories. Because there are 3 categories of nutritional status variables in this study (thinness, normal, and overweight), the data analysis is divided into 2 parts, namely, (1) thin and normal nutritional status, and (2) fat and normal nutritional status. For the first analysis, respondents with thin and normal nutritional status amounted to 79. The second analysis, namely respondents with fat and normal nutritional status, amounted to 106.

Before data collection, researchers conducted ethical tests and received information that they had passed the ethical review from the Esa Unggul Research Ethics Commission with number 0992-04.007/DPKE-KEP/FINAL EA/UEU/IV/2022.

Result and Discussion

Characteristics of Research Respondents
This study was conducted on late-adolescent female students who were in the age range of

17–25 years, with a total of 122 people. The characteristics of respondents assessed were age, learning level, body image, mindful eating, weight loss diet behavior, and nutritional status. More details can be seen in Table 1.

Table 1. Characteristics of respondents

Characteristic	n	%
Age		
≤20 years	69	56,6
>20 years	53	43,4
Learning Level		
Entry Level	17	13,9
Final Level	105	86,1
Nutritional Status		
Thinness	16	13,1
Normal	63	51,7
Overweight	43	35,2
Body Image		
Positive (score ≥27)	66	54,1
Negative (score <27)	56	45,9
Mindful Eating		
Mindful (skor ≥94)	62	50,8
Mindless (skor <94)	60	49,2
Weight Loss Diet Behavior		
Healthy (score ≥67)	62	50,8
Unhealthy (score <67)	60	49,22

Age
The frequency distribution of respondent characteristics is presented in Table 1. In this study, all respondents fall into the category of late adolescence. Respondents aged ≤20 years amounted to 69 (56,5%), and those over 20 years old were 53 (43,4%).

According to Brown et al. (2017), adolescence, at the age of 11 to 21 years, is a period of child development into adulthood with accompanying physical, emotional, and cognitive changes. In that age range, the changes that occur greatly affect nutritional status and the need for energy, protein, vitamins, and minerals.

Learning Level
Final-year female students dominated the number of respondents, reaching 86,1%. College students have a susceptibility to nutritional problems; for example, the college years are a time of declining diet quality, which may play an important role in increasing weight.

Emerald et al. (2019) and Ramírez-Contreras et al. (2021) describe that the body

mass index of college students is directly or indirectly related to eating habits and eating practices. Ways such as skipping breakfast, neglecting to eat at the right time, lack of sleep, and consuming junk food are common among college students.

Nutritional Status

Nutritional status in adolescents, especially at the age of 11 to 21 years, is influenced by increased growth rate and physical development, sexual maturation, and lifestyle changes that can affect nutritional intake (Brown et al., 2017). In this study, it is known that respondents are mostly in the categories of normal nutritional status (51,6%), overweight (35,2%), and thinness (13,1%).

Body Image

Shoraka et al. (2019) interpret body image as the subjective imagination a person has about his body. In this study, respondents with positive body image were 66 (54,1%) compared to those with negative body image, 56 (45,9%). The number of female college students who had a more positive body image compared to a negative body image was also found in the study by Irawan and Safitri (2014).

Female students who have a positive body image tend to feel their body is ideal and satisfied with their physical appearance. Gender is a factor that affects the development of a person's body image. The observations of Wertheim & Paxton (2011) show that adolescent girls are often disturbed by weight gain and dissatisfaction with body shape, face, skin, muscles, and fitness.

Mindful Eating

Mindful eating is defined as a skill learned based on mindful awareness without judgment of the physical and emotional sensations associated with eating, such as understanding the body's signals of hunger and satiety, as well as the suitability of food and its intake according to the body's needs (Clementi, 2015).

In this study, respondents who had mindful eating behavior, self-awareness, and experience with food were more numerous, namely 62 female students (50,8%). Hilmia (2020) found that the majority of respondents were university students in Malang City with moderate (71,1%) and high (24,4%) mindful eating levels.

Weight Loss Diet Behavior

Weight-loss dieting is a method of limiting food intake in an efficient way to reduce obesity and improve health. In this study, the number of female student respondents who showed healthy and unhealthy weight loss diet behavior did not differ much. Respondents with healthy dietary behavior were 62 people (50,8%), while unhealthy people were 60 people (49,2%).

The proportion of respondents is not much different from the research of Irawan and Safitri (2014), which showed respondents with healthy dietary behavior at 53%. An unhealthy diet can lead to several negative consequences, such as greater weight gain and an increased risk of obesity, a lack of food intake, and eating disorders (Sukamto et al., 2020).

The Relationship ff Body Image, Mindful Eating, and Weight Loss Diet Behavior with Thinness and Normal Nutritional Status

All respondents with thinness nutritional status in this study had a positive body image (100%). This high percentage is thought to be due to the tendency of female students to feel confident and satisfied with their appearance and thin body shape.

The results of the chi-square test showed that there was a significant relationship between body image and thinness and normal nutritional status (p-value <0,05). Body image is one of the important factors related to its correlation with nutritional status, especially in women. Body image is influenced by environmental factors such as family and friends, which can also affect a person's knowledge, physical activity, and diet.

Most respondents (69%) with thinness nutritional status have mindless eating practices or lack self-awareness and experience of food. This is thought to be because all respondents are on a weight-loss diet, so there is a tendency among them to limit the type and amount of food excessively. This causes their nutritional needs to not be met according to their needs.

The weak practice of mindful eating is characterized by the tendency of female students to lack focus when eating and simultaneously think about other things in a

hurry or while doing other activities, such as operating smartphones, watching video shows, talking, and other things, as also found in research by Hilmia (2020).

Table 2. Relationship of body image, mindful eating, weight loss diet behavior with thinness and normal nutritional status

Variable	Nutritional Status				Total		p-value
	Thinness		Normal				
	n	%	n	%	n	%	
Body Image							
Negative <27	0	0	23	37,0	23	29,1	0,004
Positive ≥27	16	100,0	40	63,0	56	70,9	
Mindful Eating							
Mindless <94	11	69,0	27	43,0	38	48,1	0,116
Mindful ≥94	5	31,0	36	57,0	41	51,9	
Weight Loss Diet Behavior							
Unhealthy <67	14	88,0	30	48,0	44	55,7	0,010
Healthy ≥67	2	12,0	33	52,0	35	44,3	
Total	16	100,0	63	100,0	79	100,0	

The results of the chi-square test calculation conducted on the relationship of mindful eating with thin and normal nutritional status obtained (p-value > 0,05). This showed that there was no significant relationship between mindful eating and thinness or normal nutritional status in female students. Mindfulness when eating is more process-oriented, where individuals reward the eating experience more than with regard to intake restriction.

As many as 88% of the total respondents who are thinness have unhealthy weight-loss diet behaviors. This shows that those who do weight loss diets are not only those with overweight nutritional status; even those with thin nutritional status are also on a diet. Pop (2017) also found the same thing: people with low body weight are willing to lose weight to fit the expected standard of physical attractiveness.

Based on the calculation of the chi-square test, it was found that there was a significant relationship between weight loss diet behavior and thin and normal nutritional status with a p-value of <0,05. The high percentage of female students behaving on unhealthy diets with thinness nutritional status confirms the relationship between the two variables. Common dietary behaviors among female students in this study are skipping breakfast, consuming low-calorie foods, rarely consuming vegetables and fruits, and not being selective in choosing food.

The Relationship of Body Image, Mindful Eating, and Weight Loss Diet Behavior with Overweight and Normal Nutritional Status

This study found a significant relationship between body image, overweight, and normal nutritional status (p-value <0,05). Most female college students (76%) with an obese nutritional status have a negative body image. This is related to one aspect of the body image questionnaire used, namely anxiety about being obese (overweight preoccupation). Female students who have a negative body image feel anxious about obesity and tend to go on weight-loss diets.

This result is in line with the results of previous research by Wati & Sumarmi (2017), which showed that adolescent girls who are overweight tend to have a negative body image. Dissatisfaction with body size, such as overweight and obesity, is more prevalent among women than men, as shown by the results of Aljadani (2019) research among young Saudi women and more recently by Gruszka et al. (2022).

More than half of the total respondents with an obese nutritional status have mindless eating practices. This suggests that female college students often take it unknowingly about food, which can have profound effects on diet and weight. Based on Table 3, the results of the chi-square test showed no relationship between mindful eating, overweight, and normal nutritional status. The results of this study are in line with what Anderson et al.

(2016), mindful eating does not correlate strongly with an increased body mass index. The results of this study also confirm what Nelson (2017) mentioned: mindful eating is an approach to food that focuses on an individual's sensual awareness of food and has nothing to do with calories, carbohydrates, overweight, or protein. Mason et al. (2016) and Kose & Ciplak (2020) also found that people with obese nutritional status had low MEQ scores or had mindless eating practices.

Table 3. Relationship of body image, mindful eating, weight loss diet behavior with overweight and normal nutritional status

Variable	Nutritional Status				Total		p-value
	Overweight		Normal				
	n	%	n	%	n	%	
Body Image							
Negative <27	33	76	23	37	56	52,8	0,000
Positive ≥27	10	24	40	63	50	47,2	
Mindful Eating							
Mindless <94	22	51	27	43	49	46,2	0,520
Mindful ≥94	21	49	36	57	57	53,8	
Weight Loss Diet Behavior							
Unhealthy <67	16	37	30	48	46	43,4	0,389
Healthy ≥67	27	63	33	52	60	56,6	
Total	43	100,0	63	100,0	106	100,0	

This study found no association between weight loss diet behavior, overweight, and normal nutritional status (p-value > 0,05). Most respondents who are obese have healthy weight-loss diet behaviors. Heerman et al. (2017) It was also found that respondents with healthy dietary behaviors had an average higher nutritional status than those who behaved on unhealthy diets and engaged in problematic eating, namely overeating and emotional eating, and did not pay attention to the nutritional value of food.

The limitation of the study lies in the design used to only describe variables at the same time, so it cannot conclude a causal relationship. In addition, nutritional status only refers to BMI values based on body weight and height, so it cannot distinguish muscle mass from body overweight mass. The quality and level of trust in the results of this study are highly dependent on the honesty of respondents in answering questions. It is hoped that further research can develop research in terms of methods, measuring instruments, and theories used.

Conclusion

In the thinness and normal nutritional groups, nutritional status was related to body image and weight-loss diet behavior, but not mindful eating. While in the group with overweight and normal nutritional status, nutritional status is only related to body image.

In order to promote positive body image among female students, prevent eating-related problems, and maintain the nutritional status of female students, it is recommended that female students, campuses, and health counselors pay attention to aspects of mindful eating and weight loss diet behavior.

Acknowledgments

References

Abdurrahman, F. (2014). Faktor-faktor pendorong perilaku diet tidak sehat pada wanita usia dewasa awal studi kasus pada mahasiswi Universitas Mulawarman. *Psikoborneo*, *2*, 23–27. https://doi.org/10.1128/AAC.03728-14

Aljadani, H. (2019). The correlation between body mass index and body image dissatisfaction and body image perception in young saudi women. *Progress in Nutrition*, *21*(4), 984-991.

https://doi.org/10.23751/pn.v21i4.8913

Anderson, L. M., Reilly, E., Schaumberg, K., & Dmochowski, S. (2016). Contributions of mindful eating, intuitive eating, and restraint to BMI, disordered eating, and meal consumption in college students. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 21*, 83-90. https://doi.org/10.1007/s40519-015-0210-3

Brown, J., Lechtenberg, E., Murtaugh, M. A., Splett, P. L., Stang, J., Wong, R., Kaiser, L. D., Bowser, E. K., Leonberg, B. L., & Sahyoun, N. R. (2017). *Nutrition Through the Life Cycle - Sixth Edition*. Cengage Learning. www.cengage.com/highered

Cash, T. F., & Smolak, L. (2012). Understanding Body Images. In *Body Image : A Handbook of Science, Practice and Prevention*. The Guilford Press. https://doi.org/10.1007/SpringerReference_223404

Cifuentes, L., Campos, A., Silgado, M. L. R., Kelpin, S., Stutzman, J., Hurtado, M. D., Grothe, K., Hensrud, D. D., Clark, M. M., & Acosta, A. (2022). Association between anxiety and eating behaviors in patients with obesity. *Obesity Pillars*, *3*, 100021. https://doi.org/10.1016/j.obpill.2022.100021

Clementi, C. (2015). *The Relationship Between Eating Behavior and Psychological Distress Among Overweight and Obese People : Is There a Role for Mindfulness ?* Coordinatore Dottorato Relatore. https://doi.org/10.6092/unibo/amsdottorato/6868

Emerald, S. H., Thomas, M., Raju, A., Tomy, T., Frank, R., & C, L. K. (2019). Body mass index and eating habits among the university students. *International Journal of Health Sciences & Research*, *9*(3), 164. https://www.ijhsr.org/IJHSR_Vol.9_Issue.3_March2019/23.pdf

Fayasari, A., & Lestari, P. (2022). Stres dan depresi berkaitan dengan emotional eating dan mindful eating pada mahasiswa saat pandemi Covid-19. *AcTion: Aceh Nutrition Journal, 7*(2), 127-135. http://dx.doi.org/10.30867/action.v7i2.622

Gruszka, W., Owczarek, A. J., Glinianowicz, M., Bąk-Sosnowska, M., Chudek, J., & Olszanecka-Glinianowicz, M. (2022). Perception of body size and body dissatisfaction in adults. *Scientific Reports*, *12*(1), 1159. https://doi.org/10.1038/s41598-021-04706-6

Heerman, W. J., Jackson, N., Hargreaves, M., Mulvaney, S. A., Schlundt, D., Wallston, K. A., & Rothman, R. L. (2017). Clusters of healthy and unhealthy eating behaviors are associated with body mass index among adults. *Journal of Nutrition Education and Behavior*, *49*(5), 415-421. https://doi.org/10.1016/j.jneb.2017.02.001

Hilmia, M. (2020). *Hubungan mindful eating dan kesehatan mental mahasiswi perguruan tinggi negeri di Kota Malang*. Universitas Islam Negeri Maulana Malik Ibrahim. http://etheses.uin-malang.ac.id/17507/

Irawan, S., & Safitri. (2014). Hubungan antara body image dan perilaku diet mahasiswi Universitas Esa Unggul. *Jurnal Psikologi*, *12*(1), 18–25. https://ejurnal.esaunggul.ac.id/index.php/psiko/article/view/1459

Kementerian Kesehatan RI. (2017). *Buku Pemantauan Status Gizi*. https://sehatnegeriku.kemkes.go.id/wp-content/uploads/2018/01/Buku-Saku-Nasional-PSG-2017-Cetak-1.pdf

Kementerian Kesehatan RI. (2018). Laporan Nasional Riskesdas 2018. In *Badan Penelitian dan Pengembangan Kesehatan* (p. 198). http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf

Kose, G., & Ciplak, M. E. (2020). Mindful eating questionnaired: eating control, emotional eating and conscious nutrition trio. *Progress in Nutrition*, *22*(2), 555–561. https://doi.org/10.23751/pn.v22i2.9312

Kose, G., & Ciplak, M. (2020). Does mindful eating have a relationship with gender, body mass index and health promoting lifestyle? *Progress in Nutrition*, *22*(2), 528–535. https://doi.org/10.23751/pn.v22i2.9268

Mason, A., Epel, E., Kristeller, J., Moran, P., Dallman, M., & Lustig, R. (2016). Effects of a mindfulness-based intervention on mindful eating, sweets consumption, and

fasting glucose levels in obese adults: Data from the SHINE randomized controlled trial. *Journal of Behavioral Medicine*, *39*(2), 201–213. https://doi.org/10.1007/s10865-015-9692-8

Nelson, J. B. (2017). Mindful eating: The art of presence while you eat. *Diabetes Spectrum*, *30*(3), 171–174. https://doi.org/10.2337/ds17-0015

Oktaviani, T. (2015). *Hubungan body image dengan pola makan remaja putri di SMA Muhammadiyah 7 Yogyakarta*. STIKES Jenderal Achmad Yani Yogyakara. https://api.semanticscholar.org/CorpusID:182161192

Pop, C. (2017). Association between body mass index and self body image perception. *Iranian Journal of Public Health*, *46*(12), 1744–1745. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5734978/

Rahamis, D. C. A., Ratag, G. A. E., & Mayulu, N. (2014). Analisis upaya-upaya penurunan berat badan pada wanita usia produktif di wilayah kerja Puskesmas Wawonasa Kecamatan Singkil Manado. *Jurnal Kedokteran Komunitas dan Tropik*, *2*(2), 63–70. https://ejournal.unsrat.ac.id/v3/index.php/JKKT/article/view/4571

Ramírez-Contreras, C., Farrán-Codina, A., Izquierdo-Pulido, M., & Zerón-Rugerio, M. F. (2021). A higher dietary restraint is associated with higher BMI: a cross-sectional study in college students. *Physiology & Behavior, 240,* 113536. https://doi.org/10.1016/j.physbeh.2021.113536

Safitri, A. O., Novrianto, R., & Marettih, A. K. E. (2020). Body dissatisfaction dan perilaku diet pada remaja perempuan. *Psibernetika*, *12*(2), 100-105. http://dx.doi.org/10.30813/psibernetika.v12i2.1673

Shoraka, H., Amirkafi, A., & Garrusi, B. (2019). Review of body image and some of contributing factors in Iranian population. *International Journal of Preventive Medicine*, *10*(1), 19. https://doi.org/10.4103/ijpvm.IJPVM_293_18

Sukamto, M. E., Fajrianthi, & Hamidah. (2020). *Prevalence of weight control behaviors among adolescent girls*. Universitas Surabaya, 120–132. https://doi.org/10.5220/0008586201200132

Wati, D. K., & Sumarmi, S. (2017). Citra tubuh pada remaja perempuan gemuk dan tidak gemuk: Studi cross sectional. *Amerta Nutrition*, *1*(4), 398-405. https://doi.org/10.20473/amnt.v1i4.2017.398-405

Wertheim, E. H., & Paxton, S. J. (2011). Body image development in adolescent girls. In T. F. Cash & L. Smolak (Eds.), *Body Image: A Handbook of Science, Practice and Prevention*. The Guilford Press.