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Evaluation of Portion Perception, Body Perception and Obesity in Adults

Yetişkin Bireylerde Porsiyon Algısı, Beden Algısı ve Obezitenin Değerlendirilmesi

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Abstract

Objective: The aim of this study was to examine the effects of obesity status, body image and gender on visual estimation of plate size and portion sizes.

Material and Method: Analytical-cross-sectional study was conducted using a questionnaire with 264 adults aged 18-65 between October 2023-September 2024. The research questionnaire consists of 4 sections: personal information, anthropometric measurements, body perception scale and visuals related to portion perception.

Results: Participants were 26% men (n=68) and 74% (n=196) women, and the mean age was 24.08±7.13 and 25.72±8.05 years for women and men, respectively. The mean body mass index (BMI) of the participants was 22.34±4.02 and 27.58±12.15 kg/m2 for women and men, respectively. There was no statistically significant difference in the estimations related to the portion size of lettuce presented in different portions according to gender, but there was a statistically significant difference between the correct estimation rates in half portion and one and a half portion presentations of potatoes and one and a half portion presentations of apples ($p<0.05$). According to the evaluation with BMI, a statistically significant difference was found between the correct estimates of one-and-a-half portion presentations for all foods ($p<0.05$). In the evaluation made according to the body perception scale, no statistically significant difference was found in the correct estimation of the portion sizes between any of the groups ($p>0.05$).

Conclusion: Gender and BMI have a limited effect on portion perception, while body perception is not an effective factor on portion perception.

Özet

Amaç: Bu çalışmanın amacı obezite durumu, beden algısı ve cinsiyetin tabak ölçüsü ve porsiyon miktarlarına ilişkin görsel tahmin üzerine etkisini incelemektir.

Gereç ve Yöntem: Analitik-kesitsel tipteki çalışma Ekim 2023-Eylül 2024 tarihlerinde 18-65 yaş arası 264 yetişkin birey ile anket kullanılarak yürütülmüştür. Araştırma anketi kişisel bilgiler, antropometrik ölçümler, beden algısı ölçeği ve porsiyon algısına ilişkin görseller olmak üzere 4 bölümden oluşmaktadır.

Bulgular: Katılımcıların %26'sı erkek (s=68) ve %74'ü (s=196) kadın olup, yaş ortalamaları kadın ve erkekte sırayla 24,08±7,13 ve 25,72±8,05 yıldır. Katılımcıların ortalama beden kitle indeksi (BKI) kadın ve erkekte sırayla 22,34±4,02 ve 27,58±12,15 kg/m2'dir. Cinsiyete göre farklı porsiyonlarda sunulan marulun porsiyon miktarı ile ilişkili tahminlerde istatistiksel olarak farklılık bulunmamış, patatesin yarım porsiyon ve bir buçuk porsiyon sunumlarında, elmanın bir buçuk porsiyon sunumunda doğru tahmin edilme oranları arasında istatistiksel olarak anlamlı farklılık görülmüştür ($p<0,05$). BKİ ile değerlendirmeye göre tüm besinlerde de bir buçuk porsiyon sunumlarının doğru tahmin edilmeleri arasında istatistiksel olarak anlamlı farklılık bulunmuştur ($p<0,05$). Beden algısı ölçeğine göre yapılan değerlendirmede ise hiçbir grup arasında porsiyon sunumlarının miktarlarına ilişkin doğru tahmin edilmelerinde istatistiksel olarak anlamlı farklılık bulunmamıştır ($p>0,05$).

Sonuç: Sonuç olarak cinsiyet ve BKİ porsiyon algısında sınırlı bir etkiye sahip olurken beden algısının porsiyon algısı üzerine etkili bir faktör olmadığı gösterilmiştir.

Introduction

Obesity is a significant problem characterized by excess fat accumulation due to an imbalance between energy intake and expenditure. It is also influenced by environmental and genetic factors (1). The most important environmental factors associated with obesity include increased fast food consumption, increased screen exposure, and increased portion sizes in out-of-home dining settings (2,3). Serving plate sizes have been shown to increase with increasing portion sizes (4). Furthermore, portion sizes for foods such as biscuits, cakes, muffins, steak, and bagels have also been observed to increase. It is known that serving food in larger portions increases its desirability, and this, in turn, increases total energy intake, making it a significant factor in the development of obesity (5,6).

The term "portion size" is used to describe the amount of food consumed. However, it has been stated that the size of the plate used can alter a person's perception of portion size (7). The effect of plate size on portion perception is referred to as the "Delboeuf Illusion." Delboeuf describes the perception of a smaller or larger portion when one of two visually drawn circles is surrounded by a larger one (8). This illusion has been linked to food presentation. It has been reported that serving two identical meals on different-sized plates affects portion perception (9).

Body image can be defined as the representation of our body we create in our minds and how it is incorporated into our thoughts, feelings, and emotions. This representation can be influenced by biological and social characteristics such as gender, age, race, and socioeconomic and cultural status (10). Understanding body image is important for understanding the social and psychological experience of being obese, the medical consequences of psychological problems, and the psychological contributors to the etiology of obesity. It is sometimes argued that the life dissatisfaction, social obligations, and body image distress associated with obesity are beneficial because they motivate people to lose weight. These are more likely to act as barriers to emotion regulation, leading to increased eating for both biological and psychological reasons. Furthermore, it is possible that these results may establish a link between obesity and chronic diseases, perhaps through their effects on serious disorders such as depression (11). Studies have shown that body image perception influences eating habits (12-14). The aim of this study was to examine the impact of obesity status, body image, and gender on visual estimation of plate size and portion sizes used in food presentation.

Material and Method

This cross-sectional study was conducted between October 2023 and September 2024 using a questionnaire with 264 adults aged 18-65. The study population consisted of adults. Power analysis was calculated using the G-Power analysis program using the relationship between portion perception and BMI data from the Pişgin, D.M., 2019 (15) study, based on similar study results. Assuming a power of 0.80 and an alpha error of 0.05, the required number of participants for the study was calculated as 264. Data were collected by the researchers through face-to-face surveys administered to adults within their social circle.

The research questionnaire consisted of four (4) sections: personal information, anthropometric measurements, a body image scale, and images related to portion perception. The first section sought general information, age, and gender.

The second section collected body weight (kg) and height (cm) based on the participants' statements. Body Mass Index (BMI) was calculated and recorded using the formula = [body weight (kg) / height (cm)] According to the World Health Organization (WHO) BMI classification, individuals with a BMI below 18.5 are classified as "Underweight/Thin," those between 18.5 and 24.9 as "Normal," those between 25 and 29.9 as "Pre-obese/Overweight," those between 30 and 30.9 as "Obese/Obese," and those above 40 as "Morbidly Obese/ Excessively Obese." (16). Individuals were grouped as underweight, normal weight, pre-obese, and obese according to the WHO Body Mass Index (BMI) classification. However, due to the insufficient number of individuals in the underweight and obese groups, the groups were combined to ensure reliable statistical analysis. In this context, underweight individuals were evaluated together with normal weight individuals, and pre-obese individuals were evaluated together with obese individuals. Participants in the study were grouped as "under 25" and "over 25" based on their BMI.

In the third section, participants were asked to indicate their body image by marking the shape closest to their own perception using the Stunkard Body Image Scale (17). This scale, which includes nine men and women figures ranging from thin to obese, was first developed by Stunkard and colleagues in 1983. For both men and women, figures 1 and 2 were considered "underweight," figures 3, 4, and 5 were considered "normal," figures 6 and 7 were considered "overweight," and figures 8 and 9 were considered obese. The correspondence between the calculated BMI category and the way participants perceived themselves was examined. Accordingly, those who perceived themselves as overweight were considered "overweight," those who perceived themselves as "underweight," and those who chose a shape appropriate to their BMI category were considered "appropriate."

The final section examined participants' portion perceptions through the visual images (lettuce, potato, apple). The preparation of the plates in the images was based on adequate and balanced nutrition. In addition, previous studies were reviewed in determining the method for the visuals, and planning was made considering the specified methods (15,18,19). The visuals used plates with diameters of 15, 21, and 26 cm, and the foods were portioned as half, full, and 1.5 portions (Full portion values were measured as 32 grams for lettuce, 97 grams for potatoes, and 195 grams for apples, and calculations were made based on these values for half and 1.5 portions). The photographs were taken with a digital camera in a bright environment. Portion sizes were determined in accordance with the recommendations of the Turkey Nutrition Guide (2022) (20). Participants were asked to make two types of assessments for each food. In the first group of photographs, the plate size was fixed, and the foods were prepared as half, full, and 1.5 portions. In the second group of photographs, plates of three different sizes were prepared, each containing a half portion of the food. Evaluation was made based on the participants' correct guess rates for each visual. Figures 1 and 2 show images for lettuce. Participants were asked to write their portion estimates in the blank boxes under each photo.

Figure 1: Images of lettuce prepared in different portions (half, full, and 1.5 portions) on plates of the same size

Figure 2: Images of lettuce prepared in the same portion on plates of different sizes.

Data analysis

The obtained data were analyzed using SPSS 22.0. Histogram curves, coefficient of variation, kurtosis-skewness values, detrended plots, and Kolmogrov-Simirnov analyses were performed to assess the data's conformity to a normal distribution. Parametric tests were applied if three or more of the parameters met normality. Frequency and percentage were used as descriptive measures in the analyses, mean and standard deviation were used as central clustering measures. Chi-square analysis was also used to compare data presented as number-percentage distributions, and Student's t-test was used for data presented as mean and standard deviation. P values below 0.05 were considered significant.

Ethical aspects of the study

The study received "Ethics Committee Approval" numbered E-15189967-050.01.04-454609 from the Aydın Adnan Menderes University Faculty of Health Sciences Non-Interventional Clinical Studies Ethics Committee. Artificial intelligence technologies were not used at any stage of the research or in the writing of the article. In addition, individuals were informed about the study, and informed consent was obtained. Helsinki Declaration of Human Rights was followed in the study.

Results

The study comprised a total of 264 participants. Twenty-six percent of the participants were men (n = 68) and 74% (n = 196) were women. The mean ages for men and women were 24.08±7.13 and 25.72±8.05 years, respectively. The participants' mean BMI values were 22.34±4.02 and 27.58±12.15 kg/m^2 for women and men, respectively. When classified according to BMI values a statistically significant difference was found between BMI values and distributions by gender (p<0.05) (Table 1). When individuals' body image was examined, it was determined that more than half of the participants in both genders saw themselves as their actual body image. A statistically significant difference was observed in the distribution of body image by gender (p<0.05) (see Table 1).

The participants' portion sizes were examined by stratifying them according to gender, BMI, and body image. Table 2 shows the distribution of correct guesses is shown for foods prepared in half, one (1), and one and a half (1.5) portions on plates of the same size. No statistically significant difference was found in guesses for lettuce based on gender. However, a statistically significant difference was found between the correct guess rates for half and one-and-a-half portions of potatoes and one-and-a-half portions of apples. Women were shown to have higher portion size estimation rates than men (p<0.05). When assessing BMI, the normal group cutoff value was used, and the assessment was based on individuals with a BMI of approximately 25 and above. For all foods, a statistically significant difference was found between correct guesses for one-and-a-half portions, and normal-weight individuals were found to have higher portion size estimation rates (p<0.05). In the evaluation made according to the body perception scale, no statistically significant difference was found in the correct estimation of portion sizes between any group (p>0.05).

The distribution of correct guesses for foods prepared in half portions on different sized plates is shown in Table 3. No statistically significant difference was found in the guesses for lettuce and potatoes by gender, however, a statistically significant difference was found between the correct guess rates for apples on a medium plate (p<0.05). Consequently, women subjects demonstrated a higher rate of accurate guesses for apples presented on a medium-sized plate (p < 0.05). When making the BMI assessment, the normal group cutoff value was used, and the assessment was based on individuals with a BMI above and below 25. Accordingly, a statistically significant difference

Table 1: Baseline charasteristics of individuals

	Men (n:68)	**Women (n:196)**	**p**
Age (year)	25.72±8.05	24.08±7.13	0.114**
BMI (kg/m²)	27.58±12.15	22.34±4.02	0.001**
BMI (kg/m²) groups	**n (%)**	**n (%)**	
<25	33(48.5)	157(80.1)	p<0.001*
≥25	35(51.5)	39(19.9)	
Body Perception			
Under	9 (13.2)	13 (6.6)	
Appropriate	45 (66.2)	114 (58.2)	0.037*
Above	14 (20.6)	69 (35.2)	

**Student t test *Chi square test

Table 2: Individuals' correct prediction rates for presentations of different portions on the same plate size

	Lettuce[1]	Lettuce [2]	Lettuce [3]	Potatoes[1]	Potatoes [2]	Potatoes [3]	Apple[1]	Apple[2]	Apple[3]
Gender n(%)									
Women	171 (87,2)	170(86,7)	165 (84,6)	167(85,2)	157 (80,1)	155 (79,1)	149(76)	122(62,2)	140(74,9)
Men	55(80,9)	55(80,9)	51(75.0)	50(73,5)	47 (69,1)	40(58,8)	49(72,1)	46(67,6)	40(58,8)
p	0,198	0,241	0,075	0,030*	0,050	0,001*	0,516	0,425	0,012*
BMI n(%)									
<25	164(86,3)	165(86,8)	161(85,2)	159(83,7)	153(80,5)	148(77,9)	144(75,8)	120(63,2)	141(74,6)
≥25	62(83,8)	60(81,1)	55(74,3)	58(78,4)	52(70,3)	47(63,5)	54(73)	48(64,9)	45(60,8)
p	0,599	0,236	0,039*	0,311	0,072	0,017*	0,635	0,796	0,027*
Body Perception Scale n(%)									
Under	15(68,2)	17(77,3)	15(68,2)	16(72,7)	16(72,7)	15(68,2)	15(68,2)	15(68,2)	14(63,6)
Appropriate	138(86,8)	134(84,3)	129(81,6)	130(81,8)	123(77,4)	113(71,1)	119(74,8)	100(62,9)	107(67,7)
Above	73(88)	74(89,2)	72(86,7)	71(82,2)	66(79,5)	67(80,7)	64(77,1)	53(63,9)	65(78,3)
p	0,050	0,327	0,126	0,367	0,786	0,219	0,689	0,889	0,171

1: half portion, 2: 1 portion, 3: 1.5 portions *Chi square test

Table 3: Individuals' correct prediction rates for presentations of the same portions on different plate sizes

	Lettuce[1]	Lettuce [2]	Lettuce [3]	Potatoes[1]	Potatoes [2]	Potatoes [3]	Apple[1]	Apple[2]	Apple[3]
Gender n(%)									
Women	42 (21,4)	31 (15,8)	119(60,7)	133(67,9)	130(66,7)	134(68,4)	79(40,3)	42(21,4)	109(55,9)
Men	21(%30,9)	14(20,6)	42(61,8)	41(60,3)	40(58,8)	39(57,4)	29(42,6)	25(37,3)	35(53)
p	0,115	0,367	0,878	0,257	0,244	0,100	0,735	0,010*	0,686
BMI n(%)									
<25	38(20)	24(12,6)	112(58,9)	130(68,4)	122(64,6)	128(67,4)	75(39,5)	37(19,6)	98(51,9)
≥25	25(33,8)	21(28,4)	49(66,2)	44(59,5)	48(64,9)	45(60,8)	33(44,6)	30(40,5)	46(63,9)
p	0,018*	0,002*	0,277	0,168	0,962	0,314	0,447	0,000*	0,081
Body Perception Scale n(%)									
Under	7(31,8)	6(27,3)	13(59,1)	11(50)	12(54,5)	12(54,5)	9(40,9)	9(40,9)	13(61,9)
Appropriate	39(24,5)	28(17,6)	96(60,4)	105(66)	98(61,6)	100(62,9)	65(40,9)	39(24,5)	84(53,5)
Above	17(20,5)	11(13,3)	52(62,7)	58(69,9)	60(73,2)	61(73,5)	34(41)	19(23,2)	47(56,6)
p	0,515	0,285	0,926	0,216	0,121	0,136	1,000	0,216	0,729

1: 15cm plate, 2: 21cm plate, 3: 26cm plate *Chi square test was found between the correct guesses for small and medium lettuce and medium apple servings in different BMI groups ($p<0.05$). Consequently, the slightly overweight/obese (BMI ≥25) group had lower rates of correct guesses for small and medium lettuce servings and medium apple servings in different plates ($p<0.05$). In the assessment based on the body image scale, no statistically significant difference was found between the groups in terms of correct guessing of portion sizes.

Discussion and Conclusion

According to the results of this study, individuals' ability to accurately estimate portion size showed significant differences based on gender and BMI for certain foods and evaluation conditions, but no significant difference was found based on body image. Specifically, women and individuals with a BMI below 25 showed higher accuracy rates in visually estimating both different portions on the same plate and the same portions presented in different plate sizes. In contrast, overweight/obese individuals more frequently misestimated portions presented in small and medium-sized plates. This may be related to impaired portion perception and decreased sensitivity to visual cues with increased body weight. The lack of influence of body image on portion estimation suggests that environmental factors (plate size, portion presentation) play a more dominant role in portion perception, regardless of how individuals perceive themselves. These findings indicate that adjusting plate and portion sizes can support portion control, especially in overweight individuals.

Individuals' food consumption can be influenced by many factors, some of which are environmental factors. The size of the plate or portion sizes used are also important environmental factors (21). Changes in serving sizes can affect daily energy intake and are therefore associated with long-term changes in body weight (22).

Portion sizes and individual perceptions of portion sizes can vary. The plate sizes or styles used influence portion perception. A study examining body image and portion estimations in university students found that gender was an influential factor in portion estimations, and it was noted that both different amounts and different plate sizes contributed to differences in choices (23). This study used three different food types for evaluation. Accordingly, gender did not have a significant effect on every food or every evaluation method. However, in evaluations where significant differences were observed, women were found to have higher rates of accurate portion size estimation. Another study conducted with university students evaluated the presentation and predictability of pasta in different portion sizes, and found that serving it on smaller plates altered perceived portion size (19). While some studies examining different plate sizes and portion sizes found that portion perception was affected, (7,24,25) other studies demonstrated that different sizes or portion sizes had no effect on portion perception (26-28). This study found that body perception did not make a difference based on the results of assessments using different plate sizes; BMI and gender made a difference in several assessments, and women and normal-weight individuals were more likely to accurately estimate portion sizes.

According to study results, patients with excess body weight (overweight and obese) tend to underestimate the energy value of full meals compared to those with a normal BMI, but this result is not statistically significant (29). There are also studies indicating that plate size has little or no effect on food consumption (30,31). A systematic review also found that plate size has a limited effect on food consumption (32). An evaluation conducted by presenting the same amount (1 portion) of four different foods in three different plate sizes on the same plate found no relationship between gender and plate size. It has been suggested that plate size may be a factor in body weight management (15). The estimation of standard portion sizes in university students was investigated, and it was noted that the rate of correctly estimating standard portions of 10 foods was higher in women than in men (18). In our study, a limited difference in portion size accuracy was observed when evaluating by gender. Considering that portion size and preferences are also related to psychological state, a study showed that emotional eating behavior is an influential factor (33). However, no evaluation of psychological state was made in our study. Body perception refers to the assessment of how individuals view themselves based on their current body size. Studies on body perception and nutritional status have addressed eating attitudes, eating more/less, and obesity development (34-36). A study conducted with university students used a different method to assess body perception and found that body perception scores varied depending on participants' perceptions of their weight (37). A similar study also indicated that certain eating-related factors can influence individuals' body perception (38). A study conducted with adults indicated a significant relationship between body perception and diet quality, concluding that establishing healthy eating habits is important (39). Our study found that more than half of the participants viewed themselves as their current size based on their body perception assessments. Furthermore, it appears that differences in body perception are not a significant variable contributing to differences in portion size perception.

In conclusion, while the study yielded results similar to those reporting that overweight individuals tend to underestimate energy content, the fact that this effect was not evident in every assessment supports the conflicting findings in the literature. Furthermore, the study's lack of a decisive role for body image in portion perception suggests that visual and environmental cues (plate size, presentation style) may be more dominant than psychological and perceptual processes in portion perception. This indicates that portion perception is multifactorial and can yield variable results in different populations, offering a significant contribution to explaining the inconsistencies in the literature. The fact that this study was conducted with individuals recruited from the researchers' social circle is a limitation. Future research should be planned with a broader scope and a larger sample size. The visuals used in this study were prepared using a single food item. It may also be recommended to evaluate the effect on portion perception by conducting assessments with visuals prepared using mixed dishes. In addition, no restrictions were placed on BMI or gender in this study. However, more detailed studies specifically focusing on the obese/overweight group or gender would contribute to the literature.

Author Contribution

Conceptualization: AÖŞ, İDY; Data curation: AÖŞ, İDY; Formal analysis: AÖŞ; Research: AÖŞ, İDY; Methodology: AÖŞ, İDY; Project administration: İDY; Resources: AÖŞ, İDY; Software: AÖŞ; Supervision: AÖŞ; Visualization: AÖŞ, İDY; Writing – original draft: AÖŞ, İDY; Writing review & editing: AÖŞ.

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Conflict of Interest

The authors declare that they have no conflict of interest.

References

1. Kopelman, P. G. (2000). Obesity as a medical problem. Nature, 404(6778), 635-643.
2. Ledikwe, J. H., Ello-Martin, J. A., & Rolls, B. J. (2005). Portion sizes and the obesity epidemic. *The Journal of nutrition*, *135*(4), 905-909.
3. Akarçay, E., & Suğur, N. (2015). Dişarida yemek: eskişehir'de yeni orta sinifin fast-food yeme-içme örüntüleri. *Sosyoloji Araştırmaları Dergisi*, *18*(1), 1-29.

4. Nielsen, S. J., & Popkin, B. M. (2003). Patterns and trends in food portion sizes, 1977-1998. *Jama*, *289*(4), 450-453.

5. Young, L. R., & Nestle, M. (2002). The contribution of expanding portion sizes to the US obesity epidemic. *American journal of public health*, *92*(2), 246-249.

6. Young, L. R., & Nestle, M. (2003). Expanding portion sizes in the US marketplace: implications for nutrition counseling. *Journal of the American Dietetic Association*, *103*(2), 231-240.

7. Wansink, B., & Cheney, M. M. (2005). Super bowls: serving bowl size and food consumption. *Jama*, *293*(14), 1727-1728.

8. Van Ittersum, K., & Wansink, B. (2012). Plate size and color suggestibility: The Delboeuf illusion's bias on serving and eating behavior. *Journal of Consumer Research*, *39*(2), 215-228.

9. Brunstrom, J. M., Rogers, P. J., Pothos, E. M., Calitri, R., & Tapper, K. (2008). Estimating everyday portion size using a 'method of constant stimuli': In a student sample, portion size is predicted by gender, dietary behaviour, and hunger, but not BMI. *Appetite*, *51*(2), 296-301.

10. Oliveira, N., de Oliveira Coelho, G. M., Cabral, M. C., Bezerra, F. F., Faerstein, E., & Canella, D. S. (2020). Association of body image (dis) satisfaction and perception with food consumption according to the NOVA classification: Pró-Saúde Study. *Appetite*, *144*, 104464.

11. Schwartz, M. B., & Brownell, K. D. (2004). Obesity and body image. *Body image*, *1*(1), 43-56.

12. Wang, K., Liang, R., Ma, Z. L., Chen, J., Cheung, E. F., Roalf, D. R., Chan, R. C. (2018). Body image attitude among Chinese college students. *PsyCh journal*, *7*(1), 31-40.

13. Tang, C., Cooper, M., Wang, S., Song, J., & He, J. (2021). The relationship between body weight and dietary restraint is explained by body dissatisfaction and body image inflexibility among young adults in China. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *26*, 1863-1870.

14. Ohara, K., Kato, Y., Mase, T., Kouda, K., Miyawaki, C., Fujita, Y., Nakamura, H. (2014). Eating behavior and perception of body shape in Japanese university students. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *19*, 461-468.

15. Pişgin, D. M. *Porsiyon ölçü algısı ve obezite üzerine etkileri* (Publication No. 597393) [Master's thesis, İstanbul Okan University]. YOK Thesis Centre.

16. World Health Organisation (WHO). (2025). *Moderate and severe thinness, underweight, overweight, obesity*. https://apps.who.int/nutrition/landscape/help.aspx?menu=0&helpid=420

17. Stunkard, A., Sorensen, T., & Schulsinger, F. (1983). In SS Kety, LP Rowland, RL Sidman, & SW Matthysse,(Eds.), Genetics of neurological and psychiatric disorders. In: New York: Raven Press.

18. Öner, C., Özdemir, M., Telatar, B., Yeşildağ, Ş. J., & Care, P. (2016). Does plate size used in food service affect portion perception? *Turkish Journal of Family Medicine and Primary Care*, *10*(4), 182-187.

19. Almasi, N. Üniversite öğrencilerin beslenme durumu, bilgi düzeyi ve porsiyon ölçüsü algısının değerlendirmesi (Publication No. 420120) [Master's thesis, Hacettepe University].

20. "Türkiye Beslenme Rehberi (TÜBER) 2022" Sağlık Bakanlığı, Halk Sağlığı Genel Müdürlüğü, Sağlık Bakanlığı Yayın No:1031, Ankara.

21. Karaağaç Y, Bellikci Koyu E. (2021). Öğün Ortamı ile İlişkili Etmenlerin Besin Algısı ve Besin Tüketimi Üzerine Etkisi. *Turkiye Klinikleri Journal of Health Sciences/Türkiye Klinikleri Sağlık Bilimleri Dergisi.* 6(2), 304-310.

22. French, S. A., Mitchell, N. R., Wolfson, J., Harnack, L. J., Jeffery, R. W., Gerlach, A.

F.,Pentel, P. R. (2014). Portion size effects on weight gain in a free living setting. *Obesity, 22*(6), 1400-1405.

23. Karlı K, Demirel Y. (2019). Üniversite öğrencilerinde beden algısına göre porsiyon tahminlerinin değerlendirilmesi. *International Anatolia Academic Online Journal Health Sciences,* 5(2), 86-104.
24. Sharp, D., & Sobal, J. J. A. (2012). Using plate mapping to examine sensitivity to plate size in food portions and meal composition among college students. *Appetite, 59*(3), 639-645.
25. Van Kleef, E., Shimizu, M., Wansink, B. J. J. o. n. e., & behavior. (2012). Serving bowl selection biases the amount of food served. *Journal of nutrition education and behavior*, *44*(1), 66-70.
26. Rolls, B. J., Roe, L. S., Halverson, K. H., & Meengs, J. S. J. A. (2007). Using a smaller plate did not reduce energy intake at meals. *Appetite, 49*(3), 652-660.
27. Yip, W., Wiessing, K. R., Budgett, S., & Poppitt, S. D. J. A. (2013). Using a smaller dining plate does not suppress food intake from a buffet lunch meal in overweight, unrestrained women. *Appetite, 69*, 102-107.
28. McClain, A., van den Bos, W., Matheson, D., Desai, M., McClure, S. M., & Robinson, T. (2014). Visual illusions and plate design: the effects of plate rim widths and rim coloring on perceived food portion size. *International journal of obesity, 38*(5), 657-662.
29. Durma, A. C., Sosnowska, M., Durma, A. D., Śmiałowski, A., & Czupryniak, L. (2025). Analysis of Food Perception in Slim, Overweight, or Obese Individuals. *Nutrients, 17*(13), 2054.
30. Vakili, M., Jafarirad, S., Abedi, P., Amani, R., & Cheraghian, B. J. I. J. o. P. M. (2019). Visual cues and food intake: Distortion power of plate and spoon size on overweight and obese university staff. *International Journal of Preventive Medicine, 10*(1), 82.
31. Robinson, E., Sheen, F., Harrold, J., Boyland, E., Halford, J. C., & Masic, U. J. P. H. N. (2016). Dishware size and snack food intake in a between-subjects laboratory experiment. *Public Health Nutrition, 19*(4), 633-637.
32. Robinson, E., Nolan, S., Tudur-Smith, C., Boyland, E. J., Harrold, J. A., Hardman, C. A., & Halford, J. C. (2014). Will smaller plates lead to smaller waists? A systematic review and meta-analysis of the effect that experimental manipulation of dishware size has on energy consumption. *Obesity Reviews, 15*(10), 812-821.
33. Djupegot, I., Hansen, S., & Lähteenmäki, L. (2021). What you say and what you do: exploring the link between consumers' perception of portion size norms and reported behaviour for consumption of sweets and crisps. *Food Quality and Preference*, *92*, 104216.
34. Tayhan, F. (2023). Üniversite öğrencilerinde sosyal medya bağimliliği, beden algisi, vücut kompozisyonu ve yeme bozukluklari arasindaki ilişkinin incelenmesi. *Karya Journal of Health Science*, *4*(2), 139-145.
35. Kömürcü, A., & Derin, D. Ö. (2024). Sosyal medya kullaniminin beden algisi ve yeme tutumuna etkisi. *Beslenme Bilimleri Alanında Uluslararası Araştırmalar I*, 57.
36. Boğaz, M. E., Kutlu, R., & Cihan, F. G. (2019). Obezite ile yeme davranışı, beden algısı ve benlik saygısı arasındaki ilişki. *Cukurova Medical Journal*, *44*(3), 1064-1073.
37. Çiftçi, F. (2012). *Üniversite öğrencilerinin beden algısı ve yeme tutumları arasındaki ilişki.* (Publication No. 329169) [Master's thesis, Isparta Süleyman Demirel University].
38. Zarifoğlu, A. (2019). *Farklı fakültelerdeki üniversite öğrencilerinde ortoreksiya nervoza görülme sıklığı ile yeme tutum davranışları ve beden algısı arasındaki ilişkinin incelenmesi.* (Publication No. 580128) [Master's thesis, Hasan Kalyoncu Üniversity].
39. Ekici, H. E. (2019). Yetişkin bireylerde diyet kalitesi ve beden algısı arasındaki ilişki ve bireylerin beslenme bilgi düzeylerinin belir-

lenmesi. (Publication No. 551727) [Master's thesis, Selçuk Üniversity].