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The Relationship Between Cooking and Food Skills and Obesity in Women: A Cross-Sectional Research

Kadınlarda Pişirme ve Yiyecek Hazırlama Becerileri ile Obezite Arasındaki İlişki: Kesitsel Araştırma

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ABSTRACT Objective: To assess cooking and food preparation skills among women and to evaluate the relationship between these skills and obesity. **Material and Methods:** The study was conducted with 200 women aged 19-64 at the Women's Education and Cultural Center of Altındağ Municipality in Ankara. Data on sociodemographic characteristics, dietary habits, knowledge and skills related to cooking and food preparation, and anthropometric measurements were collected. Cooking and food preparation skills were assessed using a validated scale. Binary logistic regression was used to examine the association between obesity classification and skill scores, while linear regression was used to assess relationships with anthropometric and sociodemographic variables. **Results:** Cooking and food preparation skills scores were significantly higher among women with lower education levels and among married women ($p<0.05$). Higher scores were observed in overweight and obese individuals, with significant differences in food preparation and total skill scores across all body mass index groups ($p<0.05$). Women who enjoyed cooking had significantly higher skill scores than those who did not ($p<0.05$). A 1-point increase in food preparation skills increased the odds of being overweight or obese by 1,022 times ($p=0.009$), and a 1-point increase in the total skill score increased the odds by 1,013 times ($p=0.031$). **Conclusion:** Cooking and food preparation skills may help individuals meet daily nutritional needs. However, these skills might be linked to obesity depending on how they are used. The potential impact of improper use of these skills on obesity should not be ignored.

Keywords: Nutrition; obesity; cooking skills; food skills

ÖZET Amaç: Kadın bireylerde pişirme ve yiyecek hazırlama becerisini ölçmek ve bu becerinin obezite ile ilişkisini değerlendirmektir. **Gereç ve Yöntemler:** Araştırma, Ankara'da Altındağ Belediyesi Kadın Eğitim ve Kültür Merkezi'nde 19-64 yaşlarında 200 kadın bireyle yürütülmüştür. Sosyodemografik özellikler, beslenme alışkanlıkları, pişirme ve yiyecek hazırlama bilgileri, pişirme ve yiyecek hazırlama becerileri ölçeği ve antropometrik ölçümler değerlendirilmiştir. Obezite sınıflaması ve pişirme ve yiyecek hazırlama becerileri ölçek puanları arasındaki ilişki ikili lojistik regresyon modeli ile incelenmiştir. Antropometrik ölçümler ve sosyodemografik özellikler ile toplam ölçek puanı arasındaki ilişki doğrusal regresyon modeli ile değerlendirilmiştir. **Bulgular:** Pişirme becerileri puanları, yiyecek hazırlama becerileri puanları ve toplam ölçek puanları lise mezunu altında olan kadınlarda istatistiksel olarak anlamlı düzeyde yüksek bulunmuştur ($p<0,05$). Yiyecek hazırlama becerileri ve toplam ölçek puanı evli kadınlarda istatistiksel olarak anlamlı düzeyde yüksek bulunmuştur ($p<0,05$). Pişirme becerileri puanları, yiyecek hazırlama becerileri puanları ve toplam ölçek puanları en fazla, fazla kilolu ve obez gruplarda saptanmış olup yiyecek hazırlama becerileri puanları ve toplam ölçek puanlarında tüm gruplar arasında istatistiksel olarak anlamlı farklılık belirlenmiştir ($p<0,05$). Pişirme becerileri puanları, yiyecek hazırlama becerileri puanları ve toplam ölçek puanları yemek yapmayı seven kadınlarda sevmeyenlere kıyasla istatistiksel olarak anlamlı düzeyde yüksek bulunmuştur ($p<0,05$). Beden kitle indeksi sınıflandırmasına göre zayıf ve normal bireyler referans alındığında, yiyecek hazırlama becerileri puanındaki 1 birimlik artış fazla kilolu ve obez olma riskini 1.022 kat artırırken ($p=0,009$), toplam ölçek puanındaki 1 birimlik artış fazla kilolu ve obez olma riskini 1.013 kat artırmaktadır ($p=0,031$). **Sonuç:** Yiyecek pişirme ve hazırlama becerileri, bireylerin beslenme yönergeleri doğrultusunda günlük besin ögeleri gereksinmelerini karşılamalarına yardımcı olabilir. Ancak, bu becerilerin kullanımı ile obezite arasındaki ilişkiyi incelemek önemlidir. Bu nedenle yemek pişirme ve gıda hazırlama becerilerinin yanlış kullanımının obezite ile bağlantılı olabileceği göz ardı edilmemelidir.

Anahtar Kelimeler: Beslenme; obezite; pişirme becerileri; yeme becerileri

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Obesity, characterized by excessive or abnormal fat accumulation that negatively impacts health, is a major global public health concern. Addressing this issue requires exploring new strategies and implementing effective measures to mitigate its impact.[1-3] In this context, efforts to enhance individuals' cooking and food skills (FS) have gained attention as a means to promote and safeguard public health. Cooking skills (CS) are increasingly integrated into strategies aimed at preventing and managing obesity.[4] These skills influence body weight status and diet quality, thereby affecting the risk of developing nutrition-related diseases. While CS and FS contribute to maintaining a healthy diet, improper or uninformed use of these abilities can create a complex relationship with obesity.[5] However, while CS and FS are generally associated with healthier dietary patterns, their impact on obesity is complex and influenced by various factors, including the types of foods prepared, portion sizes, and cooking methods used.[6,7]

The methods used in food preparation and cooking significantly impact the nutritional quality and overall value of food. Proper food preparation techniques not only help eliminate microorganisms and enzymes responsible for spoilage but also preserve food texture, enhance digestibility, and improve flavor. The way food is prepared and consumed can contribute to dietary quality, energy intake, and ultimately, weight status.[8] Understanding and applying appropriate principles in food preparation, cooking, and storage is essential to ensuring food safety and quality.[9]

Cooking skills, which include techniques such as chopping, mixing, and heating, are described as the mechanical or physical abilities used while preparing food. Additionally, they encompass conceptual and perceptual knowledge regarding how food properties change during cooking. Food skills, on the other hand, involve the ability to select, prepare, and cook food using available resources to create well-balanced and flavorful meals that meet individual dietary needs. These skills also encompass meal planning, budgeting, grocery shopping, and label reading, all of which are crucial for preparing meals in a home environment.[10,11] However, gaps in food literacy and practical application of these skills may lead to unhealthy dietary habits, such as frequent consumption of energy-dense, nutrient-poor foods or reliance on ultra-processed products.[12,13]

Nutritional knowledge alone is insufficient for implementing dietary recommendations and establishing healthy eating habits. Practical skills, including cooking, meal planning, and food purchasing, are necessary to translate this knowledge into action.[14] The increasing consumption of ready-to-eat foods and meals out of the house-both connected to rising obesity rates-highlights the necessity of evaluating and promote people' cooking and food skills. While existing research has focused on the positive relationship between CS and healthy eating, there is limited understanding of how different levels and applications of these skills may contribute to or mitigate obesity risk.[15,16] Recognizing this, Lavelle et al. developed Cooking and Food Skills Scale in 2017.[10] Although studies mostly emphasize that low CS and FS cause obesity, it is obvious that the opposite potential is also ignored.[15,17] Although overweight and obese individuals mostly tend to eat fast-food-style processed foods, it should not be forgotten that there are also those among these individuals who use CS and FS very well.[18,19] CS and FS can cause a misconception that it always means producing healthy food. It should not be forgotten that overweight and obese individuals actually spend a lot of time in the kitchen and improve themselves in the use of new recipes and techniques. At this point, in addition to the use of correct techniques, the amount of food produced is also important. Therefore, portion control, which is a very important point for overweight and obese individuals, emerges.[20,21] Moreover, no matter how well these skills are used, the issue of which types of food are ultimately chosen to cook is also very important. In other words, healthy/unhealthy food selection and the presence/absence of portion control can mask CS and FS. In addition to the existence of these abilities, it is essential in which way they are used.

This research aims to assess CS and FS of women, who play a key role in meal planning in Türkiye, and examine the relationship between these skills and obesity. This study aims to contribute to the literature in a different way by determining the effects of possible deficiencies in CS on eating habits

and contributing to the development of interventions to encourage healthier eating habits.

MATERIAL AND METHODS

PARTICIPANTS

This study has a cross-sectional design and aims only to explore correlation. Therefore, it is not possible to establish a cause-effect relationship, only the relationship between variables was examined. This research was conducted with 200 women between the ages of 19-64 in Altındağ Municipality Women's Education and Culture Center in Ankara. However, this group only represents individuals from a local center and therefore may not directly reflect the female population in Türkiye. The sample selection was made for practical reasons and accessibility. Before obtaining the research data, all of the women were made knowledgeable about the study and women who volunteered were incorporated into the study. Data were not collected from individuals aged between 19-64 years, who were illiterate and did not have the cognitive functions to answer the questions correctly. The research universe was selected from women who came to the Altındağ Municipality Women's Education and Culture Center, and using the G*power statistical sample analysis application (significant threshold: 0.05; power: 0.90; effect size: 0.5), it was found that 200 women were sufficient.[22] Research was carried out between March-June 2022 in compliance with the Helsinki Declaration and the approval of the Ankara University ethics committee with decision number 410952 and dated January 24, 2022 was acquired.

STUDY PLAN

The questionnaire form prepared by the researchers interview technique consists of 2 parts: sociodemographic characteristics (education status, marital status, employment status, income level, likes to cook, frequency of cooking at home, menu planning status, making a shopping list status, label reading status, meal preparation time) and Cooking and Food Skills Scale. The questionnaire included a total of 45 questions, including questions on demographic characteristics, anthropometric measurements and nutritional status, as well as questions on eating and cooking skills. The Cooking and Food Skills Scale consisted of 14 questions assessing CS and 19 questions assessing food preparation skills. The research data were gathered by applying a face to face survey method. In addition, waist measurements, hip and neck circumference using a stadiometer for height, body weight, and a non-flexible tape measure, the percentage of body fat, lean body mass LBM and body water percentage were measured by the researchers with "TANITA-BC-545-N" in accordance with the rules.[23] Anthropometric measurements were made by trained researchers. The measurement devices (stadiometer, tape measure, TANITA-BC-545-N device) were calibrated before each measurement. Measurements such as height, body weight, waist, hip and neck circumference were taken at least twice from the participants to ensure accuracy. Waist to hip ratio was obtained by calculating waist (cm)/hip from the data obtained. Women with waist-to-hip ratio <80 cm were considered low risk in terms of metabolic health those with 0.81-0.84 cm were considered medium risk, and those ≥0.85 were considered high risk.[24] In the calculation of waist/height ratio, <0.5 normal, between ≥0.5 and <0.6 increased risk, ≥0.6 as very high risk.[25] Threshold levels for neck circumference measurement for overweight or obesity are based on women ≥34 cm.[26,27] Using body weight (kg) and height (m), the "Body Mass Index (BMI) (kg/m^2)" is computed using the formula [body weight (kg)/height^2 (m^2)] and assessed using the classification system of the World Health Organization.[28]

COOKING AND FOOD SKILLS SCALE

This study used the "Cooking Skills and Food Skills Scale" developed by Lavelle et al. in 2017.[10] The Turkish validity and reliability of the scale were conducted by Keleş and Ok Akçil in 2021.[29] In the Turkish validity and reliability study of the scale, Cronbach's alpha internal consistency coefficient (α=0.954) was found to be high. The Cooking and Food Skills Scale consists 33 items with 2 sub-dimensions. There are 14 items in the CS sub-dimension and 19 items in the FS sub-dimension. Scale has an 8-item likert between from 1 (atrocious) to 7 (excellent) with a never/rare option, and is a 33-item

questionnaire originally. Scores ranging from 1-7 are added for the skills employed after participants are asked to judge their performance on each assignment. Rarely or never do participants who check receive zero points. Cooking and food abilities improve with a higher overall score.[10]

DATA ANALYSES

Assessed qualitative and quantitative data are presented with descriptive statistics. Quantitative factors was provided as standard deviation and mean, whilst qualitative variables were evaluated as percentage, number. Normal distribution quantitative data was investigated by Kolmogrov-Smirnov test. When the data were normally distributed, for quantitative variables, 2 independent variables were compared using the independent t-test, and 3 or more independent groups were compared using the one-way analysis of variance. In cases where the data did not exhibit a normal distribution, 2 independent variables for quantitative variables were compared using the Mann-Whitney U Test, and 3 or more independent groups were compared using the Kruskal-Wallis test. The relationship between scale scores and obesity classification was determined using a binary logistic regression model. The connection between measurements of anthropometry and sociodemographic characteristics and the total scale score was evaluated with a linear regression model. The statistical package SPSS 27.0 was used to assess the data's statistical analysis.

RESULTS

When total scores of women's obesity status and cooking and FS were examined, it was determined that overweight women in the 18-30 age range had the highest score, and obese women in the 31-49 age group and 50-64 age range had the highest score. Generally, obese women have the highest score with 173.6 points. When the scale scores of all individuals based on age groups were evaluated, it was found that the 31-49 age group had the highest score, but there was no difference between the age groups ($p>0.05$) (Figure 1).

Average CS score for women was 75.8±14.8 points, the average FS score was 97.7±22.2 points, total CS and FS score was 170.2±33.3 points. All scores were found to be higher in women who were lower than high school graduates ($p<0.05$). FS and total scale score were found to be higher in married women ($p<0.05$). CS scores, FS scores and total scale scores were determined the most in the overweight and obese groups, while a difference was determined between all groups for FS scores and total scale scores ($p<0.05$) (Table 1).

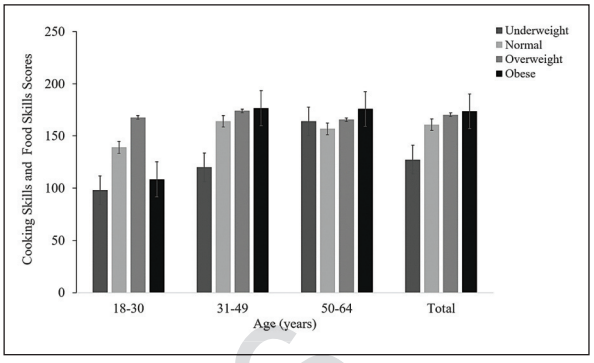

FIGURE 1: CS and FS total score distributions according to age and BMI classification

CS scores, FS scores and total scale scores were determined higher in women who liked to cook compared with those who did not ($p<0.05$). CS scores, food and total scale scores were found higher in those who cooked at home for 5 or more times a week compared to those who cooked at home 3-4 times a week ($p<0.05$). All scores were found higher in those who did menu planning compared to those who did not ($p<0.05$). FS and total scale scores of those who made shopping lists were found higher than those who did not ($p<0.05$). FS and total scale scores of those who read food labels were found higher than those who did not ($p<0.05$). FS scores of those with a cooking time of less than 1 h were found higher than those with a cooking time of 1 h or more ($p<0.05$) (Table 2).

When lean and normal individuals according to BMI classification are taken as reference, 1-unit increase in FS score increases the risk of being overweight and obese 1,022 times ($p=0.009$), while a 1-unit increase in total scale score increases the risk of being overweight and obese 1,013 times ($p=0.031$). When those who are normal according to the neck circumference classification are taken as ref-

TABLE 1: Characteristics of women by level of CS and food skills

Characteristics	n (%)	CS and FS score CS X̄±SE	p value	FS X̄±SE	p value	CS and FS (total) X̄±SE	p value
Total	200 (100)	75.8±14.8		97.7±22.2		170.2±33.3	
Education status							
Under high school	105 (52.5)	79.5±13.5	<0.001*[a]	101.2±19.7	0.017*[a]	175.9±29.4	0.011*[a]
High school and above	95 (47.5)	71.8±15.1		93.7±24.2		163.9±36.3	
Marital status							
Married	171 (85.5)	76.6±12.3	0.073[b]	100.2±20.4	0.001*[b]	172.9±29.9	0.046*[a]
Single	29 (14.5)	71. 4±24.8		83.0±26.7		154.4±46.3	
Job Status							
Working	177 (88.5)	76.4±14.5	0.179[b]	98.4±21.5	0.187[a]	171.3±32.5	0.207[a]
Not working	23 (11.5)	71.4±16.4		91.9±26.9		161.9±39.2	
Income level (lira)							
Low (≤6,000)	155 (77.5)	75.9±15.4	0.939[b]	96.6±23.5	0.142[a]	169.2±35.1	0.381[a]
High (>6,000)	45 (22.5)	75.4±12.7		101.3±16.8		173.5±26.5	
Body weight status (BMI, kg/m^2)							
Underweight (<18.5)	3 (1.5)	63.0±7.0	0.086[d]	74.3±29.8	0.048*[d]	127.3±33.6	0.022*[c]
Normal (18.5-24.9)	24 (12.0)	72.8±14.0		88.6±26.7		160.8±37.6	
Overweight or obese (≥25)	173 (86.5)	76.5±14.9		99.3±21.0		172.2±32.2	

*p<0.05; [a]Independent samples t-test; [b]Mann-Whitney U test; [c]Analysis of variance; [d]Kruskal-Wallis test. CS: Cooking skills; FS: Food skills; SD: Standard deviation; BMI: Body mass index

TABLE 2: Evaluation of women's cooking and food knowledge levels

Characteristics	n (%)	CS and FS score CS X̄±SE	p value	FS X̄±SE	p value	CS and FS (total) X̄±SE	p value
Love to cook							
Yes	167 (83.5)	77.0±14.7	0.006*[b]	99.9±20.9	0.001*[a]	173.9±31.8	<0.001*[a]
No	33 (16.5)	69.8±13.9		86.0±25.1		151.3±34.8	
Frequency of home cooking (n/week)							
≥5/week	168 (84)	77.9±13.4	<0.001*[c]	101.3±19.6	<0.001*[d]	175.4±29.5	<0.001*[c]
3-4/week	21 (10.5)	63.9±16.9		74.7±26.6		137.7±41.1	
1-2/week	11 (5.5)	69.4±17.6		86.0±22.3		153.2±35.3	
Menu planning							
Yes	158 (79)	77.3 ±12.1	0.005*[b]	101.1 ±20.7	<0.001*[b]	175.0 ±29.9	<0.001*[a]
No	42 (21)	70.5 ±21.5		84.7 ±23.1		151.9 ±39.3	
Making a shopping List							
Yes	142 (71)	76.5±15.0	0.304[a]	100.9±19.9	0.004*[a]	174.5±31.2	0.004*[a]
No	58 (29)	74.1±14.1		89.8±25.5		159.7±36.2	
Reading labels							
Yes	153 (76.5)	76.5±15.0	0.379[b]	100.9±19.9	<0.001*[a]	174.5 ±31.2	0.002*[a]
No	47 (23.5)	74.1±14.2		89.8±25.5		159.7±36.2	
Meal prep time							
≥1 h	90 (45)	74.9±15.0	0.092[b]	95.3±19.6	0.022*[b]	167.6±29.3	0.235[a]
<1 h	110 (55)	76.9±14.5		100.5±24.8		173.4±37.6	

*p<0.05; aIndependent samples t-test; bMann-Whitney U test; cAnalysis of variance; dKruskal-Wallis test. CS: Cooking skills; FS: Food skills

erence, a 1-unit increase in the FS score increases the risk of being overweight and obese 1,017 times (p=0.018), while a 1-unit increase in the total scale score increases the risk of being overweight and obese 1,011 times (p=0.029). When those who are normal according to waist/height ratio classification are taken as reference, a 1-unit increase in FS score increases the risk of being overweight and obese 1,019 times (p=0.035) (Table 3).

1-unit increase in body fat percentage increases the total scale score by 0.646 units (p=0.039). 1-unit increase in body weight increases the total scale score by 0.043 units (p=0.043). 1-unit increase in hip circumference increased the total scale score by 0.419 units (p=0.041). The total scale score of those at risk for obesity was 11,666 units higher than those with normal neck circumference classification (p=0.027). 1-unit increase in age increased the total scale score by 0.419 units (p=0.017). When the effect of education status on the total scale score is examined, the total scale score of those who are high school graduates and above is 12,002 units less than those who are less than high school graduates (p=0.011). The total scale score of those who did not like to cook is 7,194 units less than those who love to cook (p<0.001). The total scale score of those who do not plan a menu is 6,801 less (p=0.008) (Table 4).

TABLE 3: Relationship between the obesity and cooking and FS scores

	According to the BMI classification overweight and obese		According to neck circumference classification overweight and obese		According to waist/height ratio classification overweight and obese	
Variables	OR (95% CI) lower-upper	p value	OR (95% CI) lower-upper	p value	OR (95% CI) lower-upper	p value
Cooking skills	1,022 (0.995-1.051)	0.115	1,011 (0.989-1.033)	0.323	1,025 (0.997-1.054)	0.079
Food skills	1,024 (1.006-1.042)	0.009*	1,017 (1.003-1.032)	0.018*	1,019 (1.001-1.038)	0.035*
Total scale score	1,013 (1.001-1.025)	0.031*	1,011 (1.011-1.020)	0,029*	1,012 (1.000-1.024)	0.055

*p<0.05. BMI: Body mass index; OR: Odds ratio; CI: Confidence interval; SE: Standard error

TABLE 4: The relationship between anthropometric measurements and sociodemographic characteristics with cooking and food skills

	Total scale score			
Variables	B (95% CI) Lower-upper	SE	Beta	p value
BFP (%)	0.646 (0.032-1.261)	0.312	0.146	0.039*
BW (kg)	0.326 (0.010-0.642)	0.160	0.143	0.043*
WC (cm)	0.281 (-0.059-0.620)	0.172	0.115	0.104
HC (cm)	0.419 (0.018-0.821)	0.204	0.145	0.041*
Waist/hip	0.928 (-4.459-6,315)	2.732	0.024	0.734
Waist/height	6.400 (-0.258-13.058)	3.376	0.134	0.059
NC (cm)	11.666 (1.359-21.973)	5.227	0.157	0.027*
Age (year)	0.521(0.093-0.948)	0.217	0.168	0.017*
Educational status	-12.002 (-21.180--2.823)	4.654	-0.180	0.011*
Love to cook	-22.618 (-34.760--10.466)	6.160	-0.252	<0.001*
Menu planning	-23.079 (-34.053--12.106)	5.565	-0.283	<0.001*

*p<0.05. B: Non-standardized coefficient; CI: Confidence interval; SE: Standard error; Beta: Standardized coefficient; BFP: Percentage of body fat; WC: Waist circumference; HC: Hip circumference; NC: Neck circumference

DISCUSSION

People's tendencies to ready-made foods, the increase of fast food restaurants; makes it difficult to maintain a healthy body weight while living in an obesogenic environment.[30,31] Because to time constraints and convenience, the consumption of foods prepared outside the home has become increasingly common around the world.[32] It is stated that especially working individuals buy ready-packaged and processed meals due to lack of time, low cooking self-efficacy and reduced meal planning skills.[33] Researches have determined that there is a positive connection between the consumption of ultra-processed foods and high BMI, obesity and metabolic syndrome.[34-36] In this sense, cooking and FS are critical for a healthy diet of the individual. However, it is critical to use these skills correctly and to support these skills in aspects such as portion control, choosing healthy menu plans, and reading food labels.

In a study in Türkiye that included 150 men and 150 women individuals, it was determined that the FS sub-dimension score was higher than the CS sub-dimension score (CS and FS: 153.7±48.4; CS: 65.1±23.5; FS: 88.6±27.6).[37] In a study conducted in Switzerland, cooking and FS were examined separately for students, adults and dietitians, and similarly, it was determined that the adult FS sub-dimension score was higher than the CS sub-dimension score (CS: 65.43±16.04, 59.72±20.55 and 85.94±14.41; FS: 87.92±19.79, 74.44±25.22, and 110.83±16.35).[38] The results of this research showed that the FS sub-dimension score was higher than the CS sub-dimension score, consistent with literature (CS and FS: 170.2±33.3; CS: 75.8±14.8; FS: 97.7±22.2). Additionally, in this study, the scale scores were slightly higher than in other studies. This may be because only women were evaluated in this study.

In a study evaluating the Cooking and Food Skills Scale scores according to age groups, the median values of CS and FS total scale scores for 18-25, 26-35, 36-45 and 46-64 age groups were determined as 147.5, 171, 174, 165. Statistically significant differences were found between CS and FS total scale scores according to age groups, and it was stated that the groups that created this difference were between the ages of 18-25 and 26-35.[37] In a study examining the cooking habits of hispanic men and women, the Cooking Skills Scale was evaluated and no difference was found between age groups.[39] For other studies, it has been determined that cooking and FS are higher in the middle age group than in the younger age group.[7,40] In this study, unlike the literature, obesity status and age classification were considered together, and it was determined that the scale scores were higher in overweight and obese women in general. In addition, although there was no statistically significant difference between the groups according to age, it was determined that 31-49 age group had the highest score in the total scale score, followed by the 50-64 age group. According to these results, it is seen that the younger generation should increase their CS and FS.

In a study, it is stated that the total scale score increases as the education level increases.[37] Similarly, in this study, CS scores, FS scores and total scale scores were observed higher in women who were under high school graduates. The ability to employ healthy ingredients and practices is one of the key keys in maintaining a healthy body weight. Although home cooking is increasingly being promoted as a complementary means of reducing obesity, in addition to CS and FS, many factors such as grocery shopping, menu selection without reading food labels, and portioning of foods should be considered together with cooking and FS to reduce the risk of obesity. There are studies showing an association relate excitement, cooking abilities, and choosing healthier foods.[41,42] But some research have not found direct relationship for body weight, cooking frequency, and CS.[39,43,44] In addition, contrary to literature, it is stated that emotional eating can increase with the development of cooking and FS and this indirectly causes obesity. In a study, it was reported that FS and CS were positively correlated with uncontrolled eating (β=0.213, p=0.030), cognitive restraint (β=0.245, p=0.009) and emotional eating behaviors (β=0.338, p=0.001). It was stated that in overweight or obese individuals, as FS and FS improved, cognitive restraint and emotional eating behaviors also improved.[17] Although CS and FS are important on

obesity, it is obvious that many factors should not be ignored. Eating behavior is a complex process shaped by the interaction of many factors such as the individual's physiological and psychological state, food preferences, nutritional knowledge, immediate environment such as family and friends, the physical environment at home and at work, social media, and economic factors.[45,46] In particular, it is emphasized that eating habits largely depend on the total monthly income of individuals and that low income levels can lead to poorer eating habits and unhealthy eating behaviors.[47] A study examining the relationship between socioeconomic status and obesity found that low-income individuals had a higher risk of obesity adjusted for age and gender, and that uncontrolled eating and nighttime eating habits mediated this relationship.[48] It is emphasized that genetic studies continue to play a strong role in shaping the understanding of weight-regulating pathways and their perturbations in obesity.[49,50] In another study, obesity and portion control were emphasized and the importance of portion control in weight loss was stated.[51] In addition, many factors such as physical activity, smoking, presence of accompanying chronic diseases, etc. have been emphasized on obesity.[52-54] The cuisines of different cultures are also very important in food selection, and in a study evaluating excerpts on obesity and populations from the Mediterranean and Middle Eastern regions, it was emphasized that although the Middle Eastern cuisine has similarities when compared to the Mediterranean Diet, body weight decreases and cardiometabolic risk factors improve, especially with the addition of calorie restriction and physical activity intervention to the Mediterranean Diet.[55]

In our study, it was determined that the risk of obesity increases as cooking and FS increase. However, the literature generally includes findings that CS support healthy nutrition and facilitate weight control. It should be considered that these contradictory results may have different reasons and may be affected by many factors. First of all, it was determined that a large portion of female individuals are unemployed and housewives. This situation may cause women to spend more time in the kitchen and therefore increase the frequency of food preparation. Moreover, it was determined in our study that 77.5% of women have a low income level. It is known that low-income individuals tend to consume carbohydrate-heavy foods, which are generally seen as more economical and satisfying. Therefore, even if CS are developed, the energy density of preferred foods may cause weight gain. This situation shows that CS alone do not guarantee healthy nutrition. In terms of associating CS with weight gain rather than weight control, individuals' food preferences and cooking techniques come into play. In our study, it was determined that individuals generally prefer foods prepared with traditional methods. This situation may cause frequent consumption of especially fatty or floury dishes. It should also be noted that the individuals who stand out in the study spend more time in the kitchen and prepare energy-intensive meals. In addition, studies in the literature are generally conducted in Western societies or in different socioeconomic groups. However, the individuals examined in our study have a traditional culinary culture and tend to consume more carbohydrate-heavy and heavily processed foods. This situation may differ from societies that adopt nutritional habits based on vegetables and healthy fats, such as the Mediterranean diet. Therefore, how cultural differences affect the relationship between CS and weight should be examined in detail. In addition, it should be considered whether individuals with advanced CS tend to consume more food. Since women in particular are constantly responsible for preparing meals for their families, even the process of cooking itself can increase consumption. In addition, it can be thought that individuals with advanced CS may tend to try new recipes, prepare and consume more food. In addition to the contradictory results in the literature, although healthy cooking is seen as an important element when trying to gain weight, the fact that cooking and FS are not sufficient to prevent weight gain should not be ignored. Considering that 86.5% of women in our study were overweight and obese, and overweight and obese individuals received the highest scores on the scale, it is important to emphasize that large-scale studies are needed to understand the connection between body weight, kitchen skills, and cooking. In addition, individuals with high CS focus more on the taste and appearance of the food, which can make

portion control difficult. These individuals experiment more during the food preparation process, which can also lead to the risk of overconsumption. There are limited studies in the current literature that directly address the relationship between CS and portion control. Therefore, this relationship needs to be examined in more detail in future studies. Our study supports the fact that cooking and food preparation skills alone are not sufficient for weight control, and that food preferences, physical activity, economic status, genetic factors associated with obesity, accompanying chronic diseases and cultural factors are also of great importance. In the future, this relationship needs to be examined in more detail by considering multiple factors together in different socioeconomic groups and with large-sample studies.

LIMITATIONS

This study's cross-sectional nature, limited sample size and scope, the fact that the data were collected through self-report, and the fact that it was conducted only with women are among its limitations. However, the study also has its strengths. The strength of the study is that it is one of the few studies examining women's cooking and food preparation skills together with obesity. It is important that future studies evaluating the relationship between CS and FS and obesity be conducted with a broader scope and in which many factors can be addressed together.

CONCLUSION

This study shows that cooking and food preparation skills play an important role in public health, but they do not guarantee healthy nutrition on their own. In addition to CS, food preferences, portion control and physical activity have also been found to be determining factors in preventing diseases such as obesity and diabetes. In this context, it is understood that CS and FS should not be limited to the skills of choosing healthy recipes, making balanced portion control and applying correct cooking techniques. In nutrition education, it is important to provide individuals with practical skills such as making a shopping list, reading food labels and creating healthy menus, in addition to developing their CS. In addition, it was observed in our study that low-income individuals tend to consume more carbohydrate-based foods. This situation emphasizes the importance of developing economically accessible and nutritious recipes. At the same time, the low physical activity levels of individuals who spend more time at home contribute to weight gain, and at this point, strategies that encourage physical activity as well as healthy cooking habits are of great importance for public health.

The findings of our study show the necessity of adapting local and traditional cuisines to healthy cooking techniques. Adopting healthy eating habits while respecting cultural habits can be more effective in terms of public health. At this point, the importance of the intergenerational transfer of CS in childhood is also great; families, especially mothers, transferring CS to their children can lay the foundations for healthy eating habits. As a result, it is clear that cooking and food preparation skills play an important role in healthy eating and weight control, but these skills alone are not sufficient and require a broader approach. It is critical that dietitians and public health experts inform individuals about how to create a healthy diet and which cooking methods are healthier. In this way, public health policies and nutrition education can adopt a holistic approach that promotes physical activity in addition to healthy eating habits and CS.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Gül Eda Kılınç;* ***Design:*** *Gül Eda Kılınç;* ***Control/Supervision:*** *Gül Eda Kılınç, Alev Keser;* ***Data Collection and/or Processing:*** *Gül Eda Kılınç;* ***Analysis and/or Interpretation:*** *Gül Eda Kılınç;* ***Literature Review:*** *Gül Eda Kılınç;* ***Writing the Article:*** *Gül Eda Kılınç;* ***Critical Review:*** *Alev Keser.*

REFERENCES

1. Atakan MM, Koşar ŞN, Güzel Y, Tin HT, Yan X. The role of exercise, diet, and cytokines in preventing obesity and improving adipose tissue. Nutrients. 2021;13(5):1459. PMID: 33922998; PMCID: PMC8145589.
2. Fitch AK, Bays HE. Obesity definition, diagnosis, bias, standard operating procedures (SOPs), and telehealth: an Obesity Medicine Association (OMA) Clinical Practice Statement (CPS) 2022. Obes Pillars. 2022;1:100004. PMID: 37990702; PMCID: PMC10661988.
3. WHO [Internet]. WHO European Regional Obesity Report 2022. © 2025 WHO [Cited:]. Available from: https://www.who.int/europe/publications/i/item/9789289057738
4. Agarwal A. Cooking skill-an effective tool to manage obesity and diseases. J Obes Bod Weig. 2021;2(1):1-2. https://www.henrypublishers.com/henry-journal-of-obesity-and-body-weight/jobw-10004.pdf
5. Feng S, Shen X, Hao X, Cao X, Li X, Yao X, et al. Polycyclic and nitro-polycyclic aromatic hydrocarbon pollution characteristics and carcinogenic risk assessment of indoor kitchen air during cooking periods in rural households in North China. Environ Sci Pollut Res Int. 2021;28(9):11498-508. PMID: 33123888.
6. Mengi Çelik Ö, Aytekin Şahin G, Gürel S. Do cooking and food preparation skills affect healthy eating in college students? Food Sci Nutr. 2023;11(10):5898-907. PMID: 37831736; PMCID: PMC10563711.
7. Hartmann C, Dohle S, Siegrist M. Importance of cooking skills for balanced food choices. Appetite. 2013;65:125-31. PMID: 23402717.
8. Lauria F, Dello Russo M, Formisano A, De Henauw S, Hebestreit A, Hunsberger M, et al; I.Family consortium. Ultra-processed foods consumption and diet quality of European children, adolescents and adults: results from the I.family study. Nutr Metab Cardiovasc Dis. 2021;31(11):3031-43. PMID: 34518085.
9. Pepetone A, Vanderlee L, White CM, Hammond D, Kirkpatrick SI. Food insecurity, food skills, health literacy and food preparation activities among young Canadian adults: a cross-sectional analysis. Public Health Nutr. 2021;24(9):2377-87. PMID: 33648617; PMCID: PMC10195398.
10. Lavelle F, McGowan L, Hollywood L, Surgenor D, McCloat A, Mooney E, et al. The development and validation of measures to assess cooking skills and food skills. Int J Behav Nutr Phys Act. 2017;14(1):118. PMID: 28865452; PMCID: PMC5581465.
11. McGowan L, Caraher M, Raats M, Lavelle F, Hollywood L, McDowell D, et al. Domestic cooking and food skills: a review. Crit Rev Food Sci Nutr. 2017;57(11):2412-31. PMID: 26618407.
12. Teunissen L. From Food Media Entertainment to Food Literacy Education: An Investigation Into Food Media Content, Food Media Exposure, and food Literacy Among Emerging Adults [Doctoral thesis]. Belgium: University of Antwerp; 2024. https://doi.org/10.63028/10067/2052220151162165141
13. Silva P, Araújo R, Lopes F, Ray S. Nutrition and food literacy: framing the challenges to health communication. Nutrients. 2023;15(22):4708. PMID: 38004102; PMCID: PMC10674981.
14. Hagmann D, Siegrist M, Hartmann C. Acquisition of cooking skills and associations with healthy eating in swiss adults. J Nutr Educ Behav. 2020;52(5):483-91. PMID: 32088122.
15. da Costa Pelonha RN, Jomori MM, Maciel TG, Rocha JAD, Passos TS, Maciel BLL. Low Cooking skills are associated with overweight and obesity in undergraduates. Nutrients. 2023;15(11):2424. PMID: 37299388; PMCID: PMC10254578.
16. Lavelle F, Spence M, Hollywood L, McGowan L, Surgenor D, McCloat A, et al. Learning cooking skills at different ages: a cross-sectional study. Int J Behav Nutr Phys Act. 2016;13(1):119. PMID: 27842556; PMCID: PMC5109777.
17. Arslan S, Tari Selcuk K, Sahin N, Atan RM. The relationship between food and cooking skills, and eating behaviors in people with overweight or obesity. Int J Obes (Lond). 2023;47(1):60-6. PMID: 36380081.
18. Abdisa KB, Szerdahelyi E, Molnár MA, Friedrich L, Lakner Z, Koris A, et al. Metabolic syndrome and biotherapeutic activity of dairy (cow and buffalo) milk proteins and peptides: fast food-induced obesity perspective-a narrative review. Biomolecules. 2024;14(4):478. PMID: 38672494; PMCID: PMC11048494.
19. Dicken SJ, Batterham RL. Ultra-processed food and obesity: what is the evidence? Curr Nutr Rep. 2024;13(1):23-38. PMID: 38294671; PMCID: PMC10924027.
20. Chao AM, Quigley KM, Wadden TA. Dietary interventions for obesity: clinical and mechanistic findings. J Clin Invest. 2021;131(1):e140065. PMID: 33393504; PMCID: PMC7773341.
21. Chopra S, Malhotra A, Ranjan P, Vikram NK, Sarkar S, Siddhu A, et al. Predictors of successful weight loss outcomes amongst individuals with obesity undergoing lifestyle interventions: a systematic review. Obes Rev. 2021;22(3):e13148. PMID: 33200547.
22. Kang H. Sample size determination and power analysis using the G*Power software. J Educ Eval Health Prof. 2021;18:17. PMID: 34325496; PMCID: PMC8441096.
23. Kyle UG, Bosaeus I, De Lorenzo AD, Deurenberg P, Elia M, Gómez JM, et al; Composition of the ESPEN Working Group. Bioelectrical impedance analysis--part I: review of principles and methods. Clin Nutr. 2004;23(5):1226-43. PMID: 15380917.
24. WHO [Internet]. Waist circumference and waist-hip ratio: report of a WHO expert consultation © 2025 WHO [Cited:]. Available from: https://www.who.int/publications/i/item/9789241501491
25. Ashwell M, Gibson S. Waist-to-height ratio as an indicator of 'early health risk': simpler and more predictive than using a 'matrix' based on BMI and waist circumference. BMJ Open. 2016;6(3):e010159. PMID: 26975935; PMCID: PMC4800150.
26. Saka M, Türker P, Ercan A, Kiziltan G, Baş M. Is neck circumference measurement an indicator for abdominal obesity? A pilot study on Turkish adults. Afr Health Sci. 2014;14(3):570-5. PMID: 25352874; PMCID: PMC4209643.
27. Shrestha N. Neck circumference as an indicator of overweight and obesity in young adults. Am J Appl Math Stat. 2018;6(5):176-80. https://pubs.sciepub.com/ajams/6/5/1/index.html
28. WHO [Internet]. World Health Organization BMI Classification. © 2025 WHO [Cited:]. Available from:
29. Keleş G, Ok Akçil M. Pişirme ve Yiyecek Hazırlama Becerileri Ölçeğinin Türkçe geçerlik ve güvenirliğinin incelenmesi [Evaluation of validity and reliability of the Turkish Form of Cooking Skills and Food Skills Measure]. Beslenme ve Diyet Dergisi. 2021;49:26-35. https://doi.org/10.33076/2021.BDD.1405
30. Jia P, Luo M, Li Y, Zheng JS, Xiao Q, Luo J. Fast-food restaurant, unhealthy eating, and childhood obesity: a systematic review and meta-analysis. Obes Rev. 2021;22 Suppl 1(Suppl 1):e12944. PMID: 31507064; PMCID: PMC7988557.
31. Mohammadbeigi A, Asgarian A, Moshir E, Heidari H, Afrashteh S, Khazaei S, et al. Fast food consumption and overweight/obesity prevalence in students and its association with general and abdominal obesity. J Prev Med Hyg. 2018;59(3):E236-E240. PMID: 30397681; PMCID: PMC6196377.
32. Wolfson JA, Willits-Smith AM, Leung CW, Heller MC, Rose D. Cooking at home, fast food, meat consumption, and dietary carbon footprint among US adults. Int J Environ Res Public Health. 2022;19(2):853. PMID: 35055675; PMCID: PMC8775624.
33. Horning ML, Fulkerson JA, Friend SE, Story M. Reasons parents buy prepackaged, processed meals: it is more complicated than "i don't have time". J Nutr Educ Behav. 2017;49(1):60-66.e1. PMID: 27743860; PMCID: PMC5225036.

34. De Amicis R, Mambrini SP, Pellizzari M, Foppiani A, Bertoli S, Battezzati A, et al. Ultra-processed foods and obesity and adiposity parameters among children and adolescents: a systematic review. Eur J Nutr. 2022;61(5):2297-311. PMID: 35322333; PMCID: PMC8942762.

35. Nardocci M, Polsky JY, Moubarac JC. Consumption of ultra-processed foods is associated with obesity, diabetes and hypertension in Canadian adults. Can J Public Health. 2021;112(3):421-9. PMID: 33174128; PMCID: PMC8076355.

36. Rauber F, Chang K, Vamos EP, da Costa Louzada ML, Monteiro CA, Millett C, et al. Ultra-processed food consumption and risk of obesity: a prospective cohort study of UK Biobank. Eur J Nutr. 2021;60(4):2169-80. PMID: 33070213; PMCID: PMC8137628.

37. Keleş G. Pişirme ve Yiyecek Hazırlama Becerileri Ölçeğinin Türkçe Geçerlik Ve Güvenirliğinin Incelenmesi [Yüksek lisans tezi]. Ankara: Başkent Üniversitesi; 2020. https://tez.yok.gov.tr/UlusalTezMerkezi/TezGoster?key=wf-FPgY-5qjHEzEoOgvMs2NrXnPoc6MVg6-cbampnqVmpKfLmBgYvDrgBaBGNMXp

38. Mötteli S, Hotzy F. The assessment of cooking skills and food skills and their relationship with nutrition knowledge, attitude toward a healthy diet and food intake: results of a German validation study. Nutrients. 2022;14(15):3157. PMID: 35956331; PMCID: PMC9370585.

39. García-González Á, Achón M, Alonso-Aperte E, Varela-Moreiras G. Identifying factors related to food agency: cooking habits in the Spanish adult population-a cross-sectional study. Nutrients. 2018;10(2):217. PMID: 29462887; PMCID: PMC5852793.

40. Safefood. Food skills: definitions, influences and relationship with health. 2014. https://www.safefood.net/getattachment/48acd55e-0865-452f-96ca-7a959120ab18/Food-Skills-Edited-Final-Report.pdf?lang=en-IE

41. Chenhall C. Improving cooking and food preparation skills: a synthesis of the evidence to inform program and policy development. desLibris. 2010. https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/fn-an/alt_formats/pdf/nutrition/child-enfant/cfps-acc-profil-apercu-eng.pdf

42. Reicks M, Trofholz AC, Stang JS, Laska MN. Impact of cooking and home food preparation interventions among adults: outcomes and implications for future programs. J Nutr Educ Behav. 2014;46(4):259-76. PMID: 24703245; PMCID: PMC4063875.

43. Ducrot P, Fassier P, Méjean C, Allès B, Hercberg S, Péneau S. Association between motives for dish choices during home meal preparation and weight status in the nutrinet-santé study. Nutrients. 2016;8(7):413. PMID: 27399764; PMCID: PMC4963889.

44. Wolfson JA, Bleich SN. Is cooking at home associated with better diet quality or weight-loss intention? Public Health Nutr. 2015;18(8):1397-406. PMID: 25399031; PMCID: PMC8728746.

45. Walker-Clarke A, Walasek L, Meyer C. Psychosocial factors influencing the eating behaviours of older adults: a systematic review. Ageing Res Rev. 2022;77:101597. PMID: 35219902.

46. Marcone MF, Madan P, Grodzinski B. An Overview of the sociological and environmental factors influencing eating food behavior in Canada. Front Nutr. 2020;7:77. PMID: 32582753; PMCID: PMC7283517.

47. Abay KA, Ibrahim H, Breisinger C. Food policies and obesity in low-and middle-income countries. World Development. 2022;151:105775. https://doi.org/10.1016/j.worlddev.2021.105775

48. Pigeyre M, Rousseaux J, Trouiller P, Dumont J, Goumidi L, Bonte D, et al. How obesity relates to socio-economic status: identification of eating behavior mediators. Int J Obes (Lond). 2016;40(11):1794-801. PMID: 27377952.

49. Holt RIG, BChir MB, Flyvbjerg A. Genetics of obesity. In: Farooqi IS, editor. Textbook of Diabetes. 6th ed. New York: John Wiley&Sons; 2024. p.197-202.

50. Concepción-Zavaleta MJ, Quiroz-Aldave JE, Durand-Vásquez MDC, Gamarra-Osorio ER, Valencia de la Cruz JDC, Barrueto-Callirgos CM, et al. A comprehensive review of genetic causes of obesity. World J Pediatr. 2024;20(1):26-39. PMID: 37725322.

51. Jia SS, Liu Q, Allman-Farinelli M, Partridge SR, Pratten A, Yates L, et al. The use of portion control plates to promote healthy eating and diet-related outcomes: a scoping review. Nutrients. 2022;14(4):892. PMID: 35215542; PMCID: PMC8874720.

52. Zou Y, Wang D. Differences in the influence of the built environment and physical activity on obesity in urban and suburban contexts. Soc Sci Med. 2025;372:117955. PMID: 40090207.

53. Zhang J, Hou L, Lei S, Li Y, Xu G. The causal relationship of cigarette smoking to metabolic disease risk and the possible mediating role of gut microbiota. Ecotoxicol Environ Saf. 2025;290:117522. PMID: 39709709.

54. Kivimäki M, Frank P, Pentti J, Xu X, Vahtera J, Ervasti J, et al. Obesity and risk of diseases associated with hallmarks of cellular ageing: a multicohort study. Lancet Healthy Longev. 2024;5(7):e454-e463. PMID: 38945128.

55. Bays HE, Antoun J, Censani M, Bailony R, Alexander L. Obesity pillars roundtable: obesity and individuals from the Mediterranean region and Middle East. Obes Pillars. 2022;2:100013. PMID: 37990716; PMCID: PMC10661985.