The relationship between food skills and cooking skills, and eating behaviors in people with overweight or obesity

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Abstract

Background

In the present study, the authors aimed to determine food skills and cooking skills, and eating behaviors, and to evaluate the relationship between food skills and cooking skills, and eating behaviors in people with overweight or obesity.

Methods

This cross-sectional study was conducted with 185 people with overweight or obesity. The researchers collected the study data using the face-to-face interview method through a questionnaire including the Descriptive Information Form, Cooking Skills and Food Skills Scale, and Three-Factor Eating Questionnaire-R21. Numbers, percentages, arithmetic mean, standard deviation, Student's t-test, Pearson Chi-Square test, and multiple linear regression analysis were used in the analysis of the data.

Results

The mean scores the individuals obtained from the overall Cooking Skills and Food Skills Scale, and cooking skills, food skills, uncontrolled eating, cognitive restraint, and emotional eating sub-dimensions were 148.17 ± 52.20, 70.45 ± 27.48, 77.84 ± 28.90, 43.90 ± 22.74, 36.95 ± 23.93 and 38.94 ± 29.17 respectively. Multiple linear regression was fitted to determine the association between food skills and cooking skills and eating behaviors while adjusting for sociodemographic and health-related characteristics. Food skills and cooking skills were positively associated 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).

Conclusion

In people with overweight or obesity, cognitive restraint and emotional eating behaviors improve as their food preparation and cooking skills improve. Therefore, education and public health practices on eating awareness, food skills, and cooking skills can play an important role in bringing healthy behavior change into practice in society.

1. Introduction

Food skills and cooking skills, considered a basic activity of daily living, have become an increasingly important issue, especially in Western countries in parallel with the change in food consumption patterns such as consuming Away-From-Home-Food and processed food [1–3]. Food skills which include concepts such as menu planning for meals, purchasing, preparing and cooking foods, budgeting, food safety, and healthy nutrition using the resources at hand are defined as “the ability to produce balanced and delicious meals suitable for the age and needs of individuals” [4]. Cooking skills not only refer to a series of mechanical or physical skills such as chopping, mixing, and heating used in food preparation but also include conceptual and perceptual skills related to changes in food after the cooking process [5]. The increase in obesity on a global scale and the significant decline in diet quality draw attention to the issue of increasing people’s interest in home cooking and methods of preparing food to be eaten at home as a potential strategy for preventing obesity [6, 7]. Thus, it is stated that food preparation knowledge, skills, and behaviors can affect dietary intake and body weight [3].

Recent studies on cooking interventions generally indicate that cooking at home more frequently and preparing meals based on improved skills lead to better diet quality, and health and weight management [2, 8]. Improved cooking skills are reported to be associated with better diet quality, and certain components of the diet [7, 9]. In addition, it is thought that an important step can be taken in the fight against obesity by ensuring the consumption of healthier foods thanks to the development of food preparation and cooking skills in society and to the increase in the frequency of cooking at home [10].
study, it was determined that food preparation behaviors were associated with a reduced risk of obesity in women and that consuming a healthier diet largely explained this association [3]. Similarly, it is emphasized that food preparation skills are important not only for adults but also for children due to the increasing prevalence of childhood obesity and that food preparation behavior at home is an area that should be investigated [11].

Eating behavior as well as food and cooking skills is defined as a term that refers to food choices and motivations, nutritional practices, diet, and eating-related problems such as obesity and eating disorders [12]. Individuals may display different eating behaviors while they meet their nutritional needs. Many factors such as genetics, environment, hormones, emotional state, socio-demographic factors, experiences, cultural and religious beliefs, media, body image, obesity, appetite, etc. can lead to this difference [12, 13]. Disorders in eating behaviors can trigger the development of chronic diseases such as obesity, cardiovascular diseases, diabetes, hypertension, and cancer [14, 15]. At this point, it is obvious that as obesity can affect eating behavior so can deterioration in eating behavior cause obesity. Eating behaviors such as uncontrolled/overeating, emotional eating, and restrictive eating is associated with obesity [16–18]. Increasing the attention given to eating behavior and internalizing the consumed foods can help people with overweight or obesity to make healthier food choices [19, 20].

Based on this information and due to the limited number of studies in which the relationship between food preparation and cooking skills, and eating behavior is investigated in the literature, the present study was aimed at determining food skills and cooking skills, eating behaviors, and at evaluating the relationship between food preparation and cooking skills, and eating behaviors in people with overweight or obesity.

2. Materials And Methods

2.1. Study population

This study cross-sectional was conducted in the Nutrition and Diet Clinic of Bandirma Training and Research Hospital in Bandirma district of Balikesir province, located on the coast of the Marmara Sea, in the west of Turkey. The minimum sample size was calculated as 107 in the G*Power 3.1.9.7 program (power:95%, α=0.05, effect size d=0.15). However, considering the possibility of losses during the study, we decided to include 30% (n = 139) more people [21, 22].

Of the individuals who presented to the diet outpatient clinic between January 2022 and July 2022, those who agreed to participate in the study (n=308), were in the age group of 19-64 years (n=212) and had a Body Mass Index (BMI) of 25.00 kg/m² were included in the study. Of these individuals, those with a diagnosis of psychiatric disease (n=8), those who cannot feed orally and/or have difficulty in chewing and swallowing (n=4), and those who had physical health problems that would prevent the researchers from assessing their food preparation and cooking skills or from making their anthropometric measurements (n=13) and those who were pregnant or lactating (n=2) were excluded, and data about 185 individuals were evaluated in the study.

2.2. Study variables

The dependent variables of the study were uncontrolled eating, cognitive restraint, and emotional eating, which are the sub-dimensions of eating behaviors. The independent variables of the study were age, sex, marital status, education level, working in an income-generating job, monthly income, perceived health level, the number of chronic diseases, smoking, and alcohol consumption status, physical activity status, the number of meals eaten per day, skipping meals, frequency of food preparation at home, and food skills and cooking skills.

2.3. Data collection

The researchers collected the study data using the face-to-face interview method through a questionnaire including the Descriptive Information Form, Cooking Skills and Food Skills Scale, and Three-Factor Eating Questionnaire-R21.
In order to measure the BMI values of the individuals who presented to the Nutrition and Diet Clinic, the researchers who were experts in the field of nutrition and dietetics used a 100-gram precision SECA brand portable digital scale. During the measurements, the individuals wore light clothes and took off their shoes. Their height was measured in centimeters (cm) using a portable height-measuring rod with a 1-mm precision. The height-measuring rod can measure heights between 14 and 200 cm. During the measurements, the individuals stood in an upright position and their head was level with the Frankfurt plane [23]. The BMI value was calculated by dividing the body weight (kg) by the square of the height (m). Based on the BMI classification of the World Health Organization, those with a BMI of 25.00-29.99 kg/m$^2$ were considered overweight, and those with a BMI of 30.00 kg/m$^2$ and above were considered obese [24]. A questionnaire consisting of three parts was administered to those who met the inclusion criteria of the study.

2.3.1. Descriptive information form

The forms consist of items questioning the individuals’ age, sex, marital status, educational level, working status, monthly income level, number of chronic diseases, smoking status, and physical activity and skipping meals status.

2.3.2. Cooking Skills and Food Skills Scale

The 33-item scale developed by Lavelle et al. (2017) to assess cooking and food skills consists of two sub-dimensions: cooking skills (14 items) and food preparation skills (19 items). The scale is used as an alternative method that can contribute to reducing obesity. Responses given to the items are rated on an 8-point Likert-type scale. Of the skills, those which are never or rarely used are given (0) points. The scoring of the other skills ranges from 1 (very poor) to 7 (very good). The higher the total score is the better the cooking skills and food skills are [25]. The scale was adapted into Turkish by Keles and Ok (2021), and Cronbach's alpha coefficient of the Turkish version of the scale was 0.95 [10].

2.3.3. Three-Factor Eating Questionnaire-R21 (TFEQ-R21)

The TFEQ-R21 developed by Cappelleri et al. (2009) to investigate the eating behaviors of individuals consists of 21 items and the following 3 sub-dimensions: uncontrolled eating, cognitive restraint, and emotional eating. Responses given to the items are rated on a four-point Likert-type scale ranging from 1 to 4. The response options are as follows: definitely false (1), mostly false (2), mostly true (3), and definitely true (4). A high score obtained from any sub-dimension of the TFEQ-R21 indicates that the person exhibits eating behavior related to that factor highly [26]. The Turkish validity and reliability study of the TFEQ-R21 was performed by Karakus, Yıldırım, and Buyukozturk (2016). The Cronbach's alpha coefficient was reported as 0.79, 0.80, and 0.87 for the uncontrolled eating, cognitive restraint, and emotional eating sub-dimensions respectively [27].

2.4. Data analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) 23.0. In the descriptive statistics, the data were given as numbers, percentages, arithmetic mean, and standard deviation. Pearson's Chi-Squared test was used to determine whether there was a difference between people with overweight or obesity in terms of their sociodemographic and health-related characteristics. In the comparison of the mean scores obtained from the overall TFEQ-R21 and its sub-dimensions, whether the data were normally distributed was evaluated with the kurtosis and skewness coefficients, and the variables whose kurtosis and skewness values were in the range of (-1.5) and (+1.5) were accepted to have a normal distribution. To determine the variables explaining the changes in eating behaviors in people with overweight or obesity, simple and multiple linear regression models were created using the enter method. In the models, uncontrolled eating, cognitive restraint, and emotional eating sub-dimensions were the dependent variables, and cooking skills, food skills, and cooking and food skills were the independent variables. The explanatory variables of the models was evaluated with $R^2$, multicollinearity and autocorrelation, Variance Inflation Factor (VIF), and Durbin Watson (DW). The significance level of the statistical tests was accepted as $p<0.05$.

2.5. Ethical approval
Before the study was conducted, approval was obtained from the Bandirma Onyedi Eylul University Health Sciences Non-Interventional Research Ethics Committee (decision date: January 24, 2022, decision number: 2021-80). The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

3. Results

The prevalence of obesity in the individuals was 17.3%. The mean age of the individuals was 50.27±12.93 years. Of the individuals, 73.0% were women, 89.2% were married, and 61.1% had a junior high school education or below. According to their statements, 31.4% worked in an income-generating job, 29.2% had two or more chronic diseases, 28.1% were smokers, 53.5% did a moderate physical activity for at least 150 minutes a week and 45.6% did not skip meals. The average monthly income of the individuals was $193±$130 according to August 2022 exchange rates. There was a statistically significant difference between the people with overweight or obesity in terms of age, education level, monthly income, number of chronic diseases, smoking status, and physical activity variables (p<0.05, Table 1).

The mean scores the individuals obtained from the overall Cooking Skills and Food Skills Scale, and its cooking skills, and food skills were 148.17±52.20, 70.45±27.48, and 77.84±28.90 respectively. The mean scores obtained from the uncontrolled eating, cognitive restraint, and emotional eating sub-dimensions of the Three-Factor Eating Questionnaire-R21 were 43.90±22.74, 36.95±23.93, and 38.94±29.17 respectively. The mean scores obtained by the women from the overall Cooking Skills and Food Skills Scale, and cooking skills, food skills, and cognitive restraint sub-dimensions were statistically significantly higher than those obtained by the men (p<0.05). There was no statistically significant difference between people with overweight or obesity in terms of the mean scores they obtained from the overall Cooking Skills and Food Skills Scale, and cooking skills, food skills, uncontrolled eating, cognitive restraint, and emotional eating sub-dimensions (p>0.05). The Cronbach's alpha coefficients for the scales and their sub-dimensions were higher than 0.70 (Table 2).

In the simple linear regression analysis, it was determined that cooking skills and food skills were not associated with uncontrolled eating behavior (β=0.063, p>0.05), but positively associated with cognitive restriction (β=0.368, p<0.001) and emotional eating (β=0.234, p<0.001) behaviors (Model 1). Food skills and cooking skills were determined to be associated with uncontrolled eating behavior (β=0.213, p =0.030), cognitive restraint behavior (β=0.245, p=0.009), and emotional eating behavior (β=0.338, p=0.001) in the multivariate linear regression analysis, which included the variables such as age, sex, marital status, education level, employment status, monthly income, the number of chronic diseases, smoking status, physical activity and skipping meals. In addition, the women sex was a positive predictor of uncontrolled eating behavior (β=0.278, p=0.007), monthly income was a negative predictor of uncontrolled eating behavior (β=−0.224, p=0.006), and emotional eating behavior (β=−0.180, p=0.028), working at a job was a positive predictor of emotional eating behavior (β=0.220, p=0.016), and smoking was a negative predictor of cognitive restraint behavior (β=−0.181, p=0.014) (Model 2, Table 3).

4. Discussion

The prevalence of obesity and diet-related noncommunicable diseases such as type II diabetes, hypertension, and some types of cancer is increasing worldwide [28]. Recently, policymakers and researchers in the field of food and nutrition have stated their concerns about the reduction in cooking time and food preparation behavior, which are presumed to be associated with an increase in the prevalence of diet-related noncommunicable diseases [5, 29]. For instance, it has been reported that in recent years, the consumption of home-cooked food has decreased in the world, especially in developed countries, that the consumption of Away-From-Home-Food such as fast food and convenience foods has increased, and that food skills and cooking skills will decrease further in the future [2, 3, 30].

Although there is ambiguity about the effects of home cooking on health outcomes, increasing the frequency of cooking and strengthening individuals’ cooking skills are assumed to improve diet quality [31]. In several recent studies, it has been demonstrated that higher levels of cooking skills are associated with better diet quality and certain components of the diet [7, 9]. In a population-based study conducted in the United Kingdom, it was demonstrated that consuming home-cooked meals...
more frequently was associated with a higher probability of having normal body weight and body fat [32]. Méjean et al. (2018) concluded that the increase in food preparation behaviors was associated with a decrease in the risk of obesity in women and that the consumption of a healthier diet explained this relationship to a great extent [3]. In a study conducted with older people, no association was determined between cooking skills and obesity. However, in the same study, low levels of cooking skills, especially in men, were determined to be associated with unhealthy eating behaviors and low body weight [31]. In another study, it was determined that women were more likely to be interested in cooking, to spend time on cooking, and to feel confident about cooking than men [33]. In the present study conducted with people with overweight or obesity, the mean scores the women obtained from the Cooking Skills and Food Skills Scale were statistically significantly higher than those obtained by the men. This result indicates that women are more confident in their food skills and cooking skills than are men, and supports previous findings regarding sex differences in this regard [34-36]. In addition, as in many countries, in the Turkish family structure, mostly, women are responsible for preparing meals at home which may account for this situation.

In recent years, it has been emphasized that one of the main factors associated with eating behaviors is cooking behaviors and skills [37]. Some studies have revealed that better cooking skills are associated with resilience to unhealthy food environments, sensitivity to food cues, and eating behaviors such as healthy eating habits that develop over time, or obesity [7, 34]. In public health science, obesity is assumed an important consequence of the lack of knowledge about eating healthy foods or preparing and cooking healthy foods for oneself [38]. On the other hand, it is stated that unhealthy eating behaviors together with unhealthy body weight control efforts lead to weight gain in individuals [14]. In several studies, it has been demonstrated that unhealthy eating behaviors, especially emotional eating behaviors, predict a high BMI [39] and that restrictive eating and emotional eating behaviors are more common in people with overweight or obesity than in those with normal body weight [40]. Within this context, it is thought that an important step can be taken in the fight against obesity by increasing the attention given to eating behavior, improving food preparation and cooking skills, and ensuring the selection and consumption of healthier foods [10, 19, 20]. Contrary to the literature, in our study, food skills and cooking skills of people with overweight or obesity were positively associated with cognitive restraint and emotional eating behaviors. The fact that our study had a cross-sectional design, that it was conducted with people with overweight or obesity, and that the number of women was more than that of the men may have yielded this result. In addition, the fact that the collection of the study data was based on the statements of the individuals may have been another factor in the relationship determined.

In the current study, whose focus was on the relationship between food skills and cooking skills and eating behaviors of people with overweight or obesity, it was determined that food skills and cooking skills alone were not associated with the change in uncontrolled eating behavior. On the other hand, in the regression model, which included cooking and food skills and was created to explain the change in uncontrolled eating behavior, it was determined that the women sex was a positive predictor of uncontrolled eating behavior. This result is consistent with those of previous studies [41-43] in which uncontrolled eating behavior is characterized by hedonic hunger, overeating, and a feeling of difficulty in stopping eating [44] was reported to be more common in women but contradicts with those of studies [45-47] reporting that there was no difference between sexes in terms of uncontrolled eating behavior. This may be due to the differences between the mean age and BMI of the individuals in the studies. For instance, in a study in which the relationship between genetic predisposition to obesity and eating behaviors was investigated, it was reported that with the increase in BMI, uncontrolled eating behavior could be more common in women than in men, and that genetic predisposition to obesity might lead to eating behaviors such as cognitive restraint, uncontrolled and emotional eating [48]. In addition, it is known that neuronal responses to food cues change in brain regions known to be important in the regulation of energy intake in individuals prone to weight gain and obesity [49]. Physiologically, this situation may trigger feelings of being unable to control the response to eating and may cause individuals to develop uncontrolled eating and emotional eating behaviors [50].

Eating behavior, which is a very complex process involving the interaction of many factors affecting the nutrition and health of individuals, is affected by many factors such as an individual’s physiological and psychological state, food preferences, nutritional knowledge, immediate circle such as family and friends, the physical environment at home and workplace, social media, economy [51]. In particular, it is stated that eating habits are largely dependent on monthly total income and that low income may lead to worse eating habits and unhealthy eating behaviors [52]. Aggarwal et al. (2011) concluded that
individuals with higher education and income levels had better diet quality because they could meet their dietary costs [53]. In a study in which the relationship between socio-economic status and obesity was investigated, it was determined that low-income individuals were at a higher risk of obesity adjusted for age and sex, and that uncontrolled eating and night eating behavior mediated this relationship [50]. Contrary to the literature, in our study, we determined that working in an income-generating job was a positive predictor of emotional eating behavior, and an increase in monthly income was a negative predictor of uncontrolled eating and emotional eating behaviors. This result, which provides a different perspective from the traditional idea of most previous studies, is probably related to the increased monthly income, the ease of access to healthy nutrition information, and the increase in nutritional awareness. On the other hand, working in any job can trigger emotional eating behavior in individuals due to the stress caused by the working conditions and environment.

In the present study, smoking was determined to be a negative predictor of cognitive restraint behavior. Smoking, reported as one of the leading causes of morbidity and mortality worldwide [54], can double the disease burden together with obesity [55]. On the other hand, it is stated that nicotine in tobacco has a critical role because it can not only mediate rewarding and strengthening effects but also reduce appetite and increase metabolic rate [56]. In several studies, lifestyle factors such as smoking and alcohol use, physical inactivity, and unhealthy diet have also been associated with unhealthy eating behaviors [57, 58]. In particular, an association was determined between smoking and food restriction behavior, and it was reported that smokers displayed food restriction behavior approximately twice as much as non-smokers [59]. It is also stated that most smokers tend to have lower body weights, and that smoking cessation often leads to overweight or obesity [60]. It is emphasized that this is an important reason why smokers insist on smoking [58, 60]. However, the findings of our study are not consistent with other results in the literature, which may be due to the fact that our study sample consisted of people with overweight or obesity and that cognitive restraint behavior was less common in these individuals.

4.1. Strengths and limitations of the study

The present study is very important because it is one of the first studies conducted not only to detect food skills and cooking skills in people with overweight or obesity but also to focus on the relationship between these skills and eating behaviors. In addition, the findings provide a perspective different from the traditional idea of most of the limited number of studies in the literature. On the other hand, the present study has some limitations: First, it is cross-sectional and failed to observe sequencing in cause-effect relationships. Second, its results cannot be generalized to the general population because it was conducted in a single center and only with individuals who presented to a diet outpatient clinic. Third, the data were collected based on the individuals’ reports.

5. Conclusion

With industrialization, the consumption of processed and ready-to-eat foods has increased. Many of the decisions in our food choices are now based on habit, convenience, or taste. While cooking today requires different skills than those used by previous generations, it is true that these skills remain complex. In the present study, whose focus was on the relationship between food skills and cooking skills, and eating behaviors of people with overweight or obesity, it was concluded that women had better food skills and cooking skills and that the increase in these skills was associated with an increase in cognitive restraint and emotional eating behaviors. These results suggest that interventions aimed at involving more men in food preparation and cooking behaviors can be an opportunity to address sex issues and sharing of domestic activities. In addition, it is thought that an important step can be taken in the fight against obesity by increasing the attention given to eating behaviors and ensuring the selection and consumption of healthier foods. For a healthy generation and society, it is predicted that the provision of education and public health practices for individuals of all age groups and both sexes on eating awareness, and food skills and cooking skills will play a key role in bringing about behavioral changes in society. It would be beneficial for health professionals, especially dietitians, to display a holistic approach by questioning individuals’ food skills and cooking skills, as well as their nutritional knowledge levels, lifestyle habits, physical activity levels, and eating behavior disorders. In addition, we recommended that community-based studies should be planned to clarify the relationship between food skills and cooking skills, and eating behaviors.
Declarations

Financial support

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Conflicts of interest

The authors declare that there are no conflicts of interest.

Author contributions

SA was responsible for designing the review protocol, writing the protocol and report, conducting the search, screening potentially eligible studies, extracting and analyzing data, interpreting results, creating ‘Summary of findings’ tables, and providing feedback on the report. KTS was responsible for designing the review protocol, extracting and analyzing data, interpreting results, creating ‘Summary of findings’ tables, and providing feedback on the report. NS was responsible for designing the review protocol and screening potentially eligible studies, writing the report, extracting and analyzing data, interpreting results and creating ‘Summary of findings’ tables, and updating reference lists. RMA contributed to the design of the review protocol, conducting the search, analyzing data, writing the report, interpreting results, and providing feedback on the report.

Declaration of interest: None

References


Tables

Tables 1 to 3 are available in the Supplementary Files section.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Table1Sociodemographicandhealthrelatedcharacteristicsofthestudypopulation.xlsx
- Table2CookingSkillsFoodSkillsandEatingBehaviors.xlsx
- Table3Therelationshipbetweenfoodskillsandcookingskillsandeatingbehaviorsaccordingtothelinearregressionanalysis.xlsx