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# EVALUATION OF THE EFFECTS OF SOCIAL APPEARANCE ANXIETY OF ADULT INDIVIDUALS ON FOOD PREFERENCE AND ITS RELATIONSHIP WITH ANTHROPOMETRIC MEASUREMENTS

# YETİŞKİN BİREYLERİN SOSYAL GÖRÜNÜŞ KAYGISININ BESİN TERCİHİNE ETKİSİNİN İNCELENMESİ VE ANTROPOMETRİK ÖLÇÜMLER İLE İLİŞKİSİNİN DEĞERLENDİRİLMESİ

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## ABSTRACT

**Objective:** The aim of this study was to evaluate the effects of social appearance anxiety of adult individuals who applied to a private nutrition and diet clinic in Istanbul province on their food choice and its relationship with anthropometric measurements.

**Method:** Social Appearance Anxiety Scale (SAAS) and Food Choice Questionnaire (FCQ) including questions on participants' sociodemographic characteristics and nutritional status were performed face to face. Data were analyzed with SPSS v26 (IBM Inc., Chicago, II, USA) package program.

**Results:** Mean age of participants was 40.03±12.12 years, mean body mass index (BMI) was 26.93±5.41kg/m², waist circumference was 88.97±18.17 cm., hip circumference was 101.66±17.52cm., waist/hip ratio was 0.88±0.09 cm., waist/height ratio was 0.53±0.10 cm. 197 participants were male and 313 were female. Females' median total "SAAS" score (U=25352; p<0.01), and FCQ's "Health" (U=20807; p<0.001), "Mood" (U=23941.5; p<0.001), "Convenience" (U=20520; p<0.001), "Natural Content" (U=22974.5; p<0.001), "Price" (U=27182.5; p<0.05), "Weight Control" (U=20412.5; p<0.001), "Familiarity" (U=22933.5; p<0.001), and "Ethical Anxiety" (U=24077.5; p<0.001) subfactor scores were found to be statistically significantly higher. Mood, Convenience, Natural Content, Weight Control and Ethical Concern subfactor scores decreased with increasing BMI, waist circumference, and waist/hip values (p<0.05). Increasing SAAS total scores also increased FCQ's mood and convenience subfactor scores (p<0.05).

**Conclusion:** High Social Appearance Anxiety affect food choice and body compositions.

**Key Words:** Social Appearance Anxiety, Food Choice, Anthropometric Measurement, Obesity

## ÖZ

**Amaç:** Bu çalışmanın amacı; İstanbul ilinde özel bir beslenme ve diyet kliniğine başvuran yetişkin bireylerin sosyal görünüş kaygısının besin tercihine etkisinin incelenmesi ve antropometrik ölçüm ilişkisinin değerlendirilmesiydi.

**Yöntem:** Katılımcılara, sosyodemografik özelliklerini ve beslenme durumlarını içeren Sosyal Görünüş Kaygısı Ölçeği (SGKÖ) ve Besin Seçim Anketi'nden (BSA) oluşan anketler yüz yüze uygulandı. Veriler SPSS v26 (IBM Inc., Chicago, II, USA) paket programında analiz edildi.

**Bulgular:** Katılımcıların yaş ortalaması:40.03±12.12 yıl, beden kütle indeksi (BKİ) ortalaması: 26.93±5.41kg/m², bel çevresi: 88.97±18.17 cm, kalça çevresi: 101.66±17.52cm, bel/kalça: 0.88±0.09 cm, bel/boy:0.53±0.10 cm olup, 197'si erkek ve 313'ü kadındı. Kadınların SGKÖ toplam puan ortancası (U=25352; p<0.01), BSA'nın alt faktörlerinden olan Sağlık (U=20807; p<0.001), Duygu Durum (U=23941.5; p<0.001), Uygunluk (U=20520; p<0.001), Doğal İçerik (U=22974.5; p<0.001), Fiyat (U=27182.5; p<0.05), Ağırlık Kontrolü (U=20412.5; p<0.001), Aşinalık (U=22933.5; p<0.001), Etik Kaygı (U=24077.5; p<0.001) istatistiksel olarak yüksek bulundu. BKİ, bel çevresi, bel/kalça değerleri arttıkça duygu durum, uygunluk, doğal içerik, ağrılık kontrolü ve etik kaygı alt faktör puanları azaldı (p<0.05). SGKÖ toplam puanlarındaki artış, BSA'nın duygu durum ve uygunluk alt faktör puanlarında artışa neden oldu (p<0.05).

**Sonuç**: Sosyal Görünüş Kaygısının yüksek olması besin seçimlerini ve vücut kompozisyonlarını etkilemektedir.

**Anahtar Kelimeler:** Sosyal Görünüş Kaygısı, Besin Seçimi, Antropometrik Ölçüm, Obezite

## INTRODUCTION

Human is a social being that survives by establishing relationships throughout their life [1]. Since ancient times, people have given a lot of importance to their appearance and have made an effort to make a good impression [2]. Social appearance anxiety which is a condition experienced by many individuals is a type of anxiety that develops by the evaluation of people by other individuals because of their physical characteristics [3]. An individual might think that he does not give a good expression to other people and this is known as social appearance anxiety [4]. As a result of social appearance anxiety, food behavior might develop that negatively affects health [5]. Studies support the idea that social appearance anxiety is associated with dietary habits [3,6].

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Social appearance anxiety changes one's food choices [7]. Food choice includes many factors such as psychological, social and biological. Factors that affect food choice are not clear [8]. Factors such as personal awareness, current information about food, health status, accessibility, economics, calorie need, access to food, and steps of food preparation are important in food choice [9]. It has been observed that social appearance anxiety affects food behavior by changing one's food choices [10]. Because of social appearance anxiety, negative changes in dietary habits are also reflected in body composition [11]. It is predicted that parallel to increased awareness of nutrition, improved healthy food choices with decreased nutritional disease risk also affect body composition and social appearance and reduce anxiety [12,13].This study is important to demonstrate changes in food choice as a result of an inadequate and unbalanced dietary picture by exhibiting nutritional changes due to social anxiety about personal appearance, and take measures against health problems such as obesity or underweight and shed light on future studies on this matter.

## METHOD

This study was conducted with adult individuals between the ages of 18 to 65 years who applied to a private nutrition and diet clinic in Istanbul province and agreed to participate. Cohen's effect size (r) calculation developed by Cohen was used for the study [14,15]. Cohen's effect size (r) calculation;

$$d = \frac{M_1 - M_2}{\sqrt{SD_1^2 - SD_2^2}}$$

$$r = \frac{d}{\sqrt{((D^2) + 4)}}$$

is calculated as. The studies in which scales used in the study were previously used in the literature were examined, and Cohen's effect size was calculated as r=0.225 by obtaining a study suitable for the purpose and limitations of the study. In the study, R v3.6.1 program was used for Power analysis, alpha error was taken as 5%, beta error was taken as 20%, and it was calculated that a minimum of 311 samples would be sufficient, considering that there would be a difference between the variables as a result of the study process [16,17]. However, 510 adult individuals were included into study, 313 were female and 197 were male. Participants were asked questions about sociodemographic characteristics and dietary status (taking meals, skipping meals, water consumption status), and the "Food Choice Questionnaire" (FCQ) and "Social Appearance Anxiety Scale" (SAAS) were applied.

### Data Collection Tools

*Participants' Anthropometric Measures:* Participants' body weight, waist circumference and hip circumference were measured by the researcher. Body weight measurements were performed with Tanita Perfecto brand weighing instrument, and height with a Frankfurt stadiometer fixed to the wall with feet together and without shoes. Waist circumference was measured by placing a tape measure around the middle at a point between the bottom of the ribs and the crista iliaca while standing and arms outstretched and feet together [18]. Classification of waist circumference width; <94 cm in male and <80 cm in female, low health risk associated with body weight; 94- 102 cm in male and 80-88 cm in female, high health risk associated with body weight; >102 cm in male and >88 cm in female, very high health risk associated with body weight [19]. According to WHO data, a waist/hip ratio above 0.90 in male and 0.85 in female is considered a risk [19]. Body mass index (BMI) was calculated by dividing body weight (kg) by the square of the height (kg/m²) and classification of BMI according to WHO; BMI<16.0 kg/m² is severely underweight; 16.0 kg/m²≤BMI<17.0 kg/m²; moderately underweight, 17.0 kg/m²≤BMI<18.5 kg/m²; slightly underweight, 18.5 kg/m²≤BMI<24. 9 kg/m²; normal, 25.0 kg/m² ≤ BMI <29.9 kg/m²; overweight, mild obesity, 30.0 kg/m²≤BMI<39.9 kg/m²; obese, BMI over 40 kg/m² is defined as severely obese [20].

*Social Appearance Anxiety Scale (SAAS):* The scale was developed by Hart et al [21]. SAAS contains 16 questions that are evaluated on a five-point Likert scale. The first item is reverse-coded [22]. Every item could be rated as not at all applicable (1 point), not applicable (2 points), little applicable (3 points), applicable (4 points) and extremely applicable (5 points). The lowest score to be obtained is 29 and the highest score is 116. It has been found that the higher the SAAS scores the higher the social appearance anxiety [21]. Validity and reliability analyze of the scale adapted by Doğan to Turkish was performed with three different samples of 512, 541 and 853 participants and their coefficients of internal consistency were 0.94, 0.94 and 0.95 respectively and the coefficient of test-retest reliability was 0.84, 1 month later [22].

*Food Choice Questionnaire (FCQ):* It was developed by Steptoe et al in 1995 to determine the factors that affect food choice. Steptoe et al found 9 items that affect food choice. These are health, familiarity, natural content, price, ethical concern, weight control, convenience, mood and sensory appeal. It contains 36 items that are evaluated on a four-point Likert scale ranging from not all important (1 point), little important (2 points), moderately important (3 points) and very important (4 points). In accordance with scoring, factors that affect food choice are determined [23]. Turkish adaptation, validity and reliability studies were performed by Dikmen et al in 2016. The coefficients of test-retest reliability were 0.89 and 0.95. Although there were 5 and 7-point Likert-type studies, Dikmen et al preferred the 4-point Likert type [24].

### Ethical Approval

Our quantitative study on voluntary basis was evaluated and approved by Uskudar University Non-Interventional Studies Ethics Committee at the meeting number 12 held on 28/11/2022, and after obtaining informed consent and institutional permit, it was conducted between November 2022 and February 2023.

### Statistical Analysis

Descriptive statistics for categorical variables (demographic characteristics) were presented as frequency and percentage. The consistency of numerical variables to normal distribution was controlled with "Shapiro-Wilk Test". Descriptive statistics for numerical variables were presented as mean±standard deviation for normal distribution ($\bar{X}$±SD), and as median (min-max) for nonparametric data. "Mann-Whitney U Test" was used to compare 2 independent non-parametric groups and "Kruskal-Wallis H Test" for >2 groups. The results of multiple comparison tests were presented as median and letter notation. Relationships between scales were evaluated with the "Spearman Rank Correlation coefficient" for non-parametric data. For the evaluation of the correlation coefficient, "<0.2 was accepted as very weak correlation", "0.2-0.4 as weak correlation", "0.4-0.6 moderate correlation", "0.6-0.8 strong correlation", ">0.8 very strong correlation" criteria were used [25]. "Regression Analysis" was used to test the intervariable effect. Statistical significance was set for all calculations and discussions of the study at "$p<0.05$, $p<0.01$, and $p<0.001$" and hypotheses were bilaterally established. Statistical analysis of the data was performed with the SPSS v26 (IBM Inc., Chicago, IL, USA) package program.

## RESULTS

The mean age of participants was 40.03±12.12 years, the mean BMI was 26.93±5.41kg/m2, the mean waist circumference was 88.97±18.17 cm., the mean hip circumference was 101.66±17.52cm., waist/hip ratio was 0.88±0.09cm., and waist /height ratio was 0.53±0.10cm. 38.6% of participants were male and 61.4% were female. 58.8% of participants were married, 37.3% were bachelor's degrees, 37.1% were normal weights in terms of BMI, 45.3% had low waist circumference health risk, 53.1% had no waist/hip health risk, 33.9% had waist/height health risk, 81.8% had no chronic disease and among those with chronic disease, the largest group was those with

hypercholesterolemia (28.0%), 87.1% did not use drugs constantly, 75.7% skipped a meal and the most frequently skipped meal was lunch (28.0%). Participants consumed 1.5-2 L/day water (Table 1).

**Table 1.** Descriptive statistics of demographic, anthropometric, health and nutritional findings of individuals according to gender

| Variables | Gender | | | | Total | |
|---|---|---|---|---|---|---|
| | Male | | Female | | | |
| | n | % | n | % | n | % |
| **Marital Status** | | | | | | |
| Married | 125 | 63.5 | 175 | 55.9 | 300 | 58.8 |
| Single | 72 | 36.5 | 138 | 44.1 | 210 | 41.2 |
| **Education Level** | | | | | | |
| İlliterate | 1 | 0.5 | 2 | 0.6 | 3 | 0.6 |
| Primary School Graduate | 7 | 3.6 | 18 | 5.8 | 25 | 4.9 |
| High School Graduate | 69 | 35.0 | 116 | 37.1 | 185 | 36.3 |
| Associate Degree Graduate | 27 | 13.7 | 40 | 12.8 | 67 | 13.1 |
| Bachelor's Degree | 77 | 39.1 | 113 | 36.1 | 190 | 37.3 |
| Graduate (Master's / Doctorate) | 16 | 8.1 | 24 | 7.6 | 40 | 7.8 |
| **BMI Group** | | | | | | |
| Normal (≤24.9 kg/m$^2$) | 49 | 24.9 | 140 | 44.7 | 189 | 37.1 |
| Overweight (25-29.9 kg/m$^2$) | 76 | 38.6 | 91 | 29.1 | 167 | 32.7 |
| Obese (≥30 kg/m$^2$) | 72 | 36.5 | 82 | 26.2 | 154 | 30.2 |
| **Waist Circumference Risk Status** | | | | | | |
| Low health risk (M:<94; F:<80 cm) | 73 | 37.1 | 158 | 50.5 | 231 | 45.3 |
| High health risk (M:≥94-<102; F: 80-<88 cm) | 36 | 18.3 | 41 | 13.1 | 77 | 15.1 |
| Very high health risk (M:≥102; F:≥88 cm) | 88 | 44.6 | 114 | 36.4 | 202 | 39.6 |
| **Waist-Hip Ratio Risk Status** | | | | | | |
| No risk (M:≤0.90; F:≤0.85) | 92 | 46.7 | 179 | 57.2 | 271 | 53.1 |
| Risk exists (M:>0.90; F:>0.85) | 105 | 53.3 | 134 | 42.8 | 239 | 46.9 |
| **Waist to Height Ratio Risk Status** | | | | | | |
| Risk-Free (<0.4) | 5 | 2.5 | 58 | 18.5 | 63 | 12.4 |
| Normal (0.4 -<0.5) | 43 | 21.8 | 104 | 33.3 | 147 | 28.8 |
| Risky (≥0.5 -<0.6) | 80 | 40.6 | 93 | 29.7 | 173 | 33.9 |
| Requires treatment (≥0.6) | 69 | 35.0 | 58 | 18.5 | 127 | 24.9 |
| **Chronic Disease Status** | | | | | | |
| Yes | 41 | 20.8 | 52 | 16.6 | 93 | 18.2 |
| No | 156 | 79.2 | 261 | 83.4 | 417 | 81.8 |
| **Disease Status *** | | | | | | |
| Asthma | 9 | 22.0 | 16 | 30.8 | 25 | 26.9 |
| Diabetes | 16 | 39.0 | 6 | 11.5 | 22 | 23.7 |
| High Cholesterol | 16 | 39.0 | 10 | 19.2 | 26 | 28.0 |
| **Continuous Medication Use** | | | | | | |
| Yes | 27 | 13.7 | 39 | 12.5 | 66 | 12.9 |
| No | 170 | 86.3 | 274 | 87.5 | 444 | 87.1 |
| **Medicine Type *** | | | | | | |
| Crestor | 5 | 18.6 | 3 | 7.7 | 8 | 12.2 |
| Glifor | 4 | 14.8 | 2 | 5.1 | 6 | 9.3 |
| Levotiron | 0 | 0.0 | 5 | 12.7 | 5 | 7.6 |
| **Meal Skipping Status** | | | | | | |
| Yes | 147 | 74.6 | 239 | 76.4 | 386 | 75.7 |
| No | 50 | 25.4 | 74 | 23.6 | 124 | 24.3 |
| **Skipped Meal** | | | | | | |
| Breakfast | 33 | 22.4 | 42 | 17.6 | 75 | 19.4 |
| Afternoon | 38 | 25.9 | 70 | 29.3 | 108 | 28.0 |
| Evening | 4 | 2.7 | 5 | 2.1 | 9 | 2.3 |
| Breakfast to Lunch Break | 46 | 31.3 | 61 | 25.5 | 107 | 27.7 |
| Noon to Evening | 16 | 10.9 | 38 | 15.9 | 54 | 14.0 |
| Night | 10 | 6.8 | 23 | 9.6 | 33 | 8.6 |
| **Average Daily Water Consumption** | | | | | | |
| 0-1 L/day break | 9 | 4.6 | 43 | 13.7 | 52 | 10.2 |
| 1-1.5 L/day break | 25 | 12.7 | 68 | 21.7 | 93 | 18.2 |
| 1.5-2 L/day break | 45 | 22.8 | 100 | 31.9 | 145 | 28.4 |
| 2-2.5 L/day break | 34 | 17.3 | 7 | 2.3 | 41 | 8.0 |
| 2.5-3 L/day break | 80 | 40.6 | 93 | 29.7 | 173 | 33.9 |
| 3 L/more than a day | 4 | 2.0 | 2 | 0.7 | 6 | 1.3 |

| Variables (X̄±SD) | Male | Female | Total |
|---|---|---|---|
| Age (year) | 42.73±11.89 | 38.34±11.97 | 40.03±12.12 |
| BMI (kg/m$^2$) | 28.40±4.72 | 26.01±5.62 | 26.93±5.41 |
| Waist Circumference (cm) | 99.68±15.68 | 82.23±16.32 | 88.97±18.17 |
| Hip Circumference (cm) | 108.94±17.23 | 97.08±16.11 | 101.66±17.52 |
| Waist/Hip Ratio | 0.92±0.08 | 0.85±0.09 | 0.88±0.09 |
| Waist/Height Ratio | 0.57±0.09 | 0.50±0.10 | 0.53±0.10 |

**: More than one answer was given, *BMI: Body Mass Index*

According to the gender of study participants, the median "SAAS Total" score of female [33 (16-77)] was higher than male [30 (16-78)] (U=25352; p<0.01). When female and male were compared based on the FCQ subscores presented as median respectively, female were found to be statistically significantly higher than male with "Health" [3 (2-4) vs. 2.8 (1-4); U=20807, p<0.001), "Mood" [2.8 (1-4) vs. 2.7 (1-3.7); U=23941.5, p<0.001), "Convenience" [2.8 (1-4) vs 2.6 (1-4); U=20520, p<0.001), "Natural Content" [3 (1-4) vs. 2.7 (1.7-4);

U=22974.5, p<0.001), "Price" [3 (1-4) vs. 2.8 (1-4); U=27182.5, p<0.05), "Weight Control" [2.3 (1-4) vs. [2 (1-4); U=20412.5, p<0.001), "Familiarity" [3 (1-4) vs. 2.7 (1-3.7); U=22933.5, p<0.001), and "Ethical Concern" of [2.3 (1-4) vs. 2 (1-3.7); U=24077.5; p<0.001) subfactor scores (Table 2). As BMI values of study participants increased; mood, convenience, natural content, weight control and ethical concern subfactor scores decreased by 14.6%, 10.8%, 9.4%, 16.5%, and 12.7%, respectively (p<0.05; p<0.01; p<0.001). As waist circumference values of study participants increased; health, mood, convenience, natural content, weight control, familiarity and ethical concern subfactor scores decreased by 10.7%, 14%, 15.4%, 10.6%, 18.2%, 10.2% and 14.7%, respectively (p<0.05; p<0.01; p<0.001). As hip circumference values increased; weight control and ethical concern subfactor scores decreased by 10.2% and 8.9%, respectively (p<0.05). As the waist/hip ratio increased; health, mood, convenience, natural content, weight control, familiarity and ethical concern subfactor scores decreased by 15.8%, 21.2%, 15.4%, 15.7%, 20.3%, 23.7% and 12.9%, respectively (p<0.05; p<0.01; p<0.001) (Table 2).

**Table 2.** Comparisons of SAAS total and FCQ sub factor scores on the basis of gender and the relationship between anthropometric measurements, SAAS total and FCQ sub factor scores

| Variables | | SAAS | Health | Mood | Convenience | Sensory Appeal | Natural Ingredients | Price | Weight Control | Familiarity | Ethical Anxiety |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Median (min-max) | | | | | | | | | |
| **Gender** | | | | | | | | | | | |
| Male | | 30 (16-78) | 2.8 (1-4) | 2.7 (1-3.7) | 2.6 (1-4) | 3 (1-4) | 2.7 (1-4) | 3 (1-4) | 2 (1-4) | 2.7 (1-3.7) | 2 (1-3.7) |
| Female | | 33 (16-77) | 3 (2-4) | 2.8 (1.7-4) | 2.8 (1-4) | 3 (2-4) | 3 (1.7-4) | 3 (1-4) | 2.3 (1-4) | 3 (1-4) | 2.3 (1-4) |
| **U** | | **25352** | **20807** | **23941.5** | **20520** | 28319.5 | **22974.5** | **27182.5** | **20412.5** | **22933.5** | **24077.5** |
| **p** | | **0.001**** | **<0.001***** | **<0.001***** | **<0.001***** | 0.07 | **<0.001***** | **0.021*** | **<0.001***** | **<0.001***** | **<0.001***** |
| BMI (kg/m$^2$) | **s** | 0.038 | -0.038 | **-0.146** | **-0.108** | 0.019 | **-0.094** | 0.029 | **-0.165** | -0.016 | **-0.127** |
| | **p** | 0.387 | 0.390 | **0.001**** | **0.015**** | 0.668 | **0.034*** | 0.519 | **<0.001***** | 0.712 | **0.004**** |
| Waist Circumference(cm) | **s** | 0.000 | **-0.107** | **-0.140** | **-0.154** | 0.001 | **-0.106** | 0.006 | **-0.182** | **-0.102** | **-0.147** |
| | **p** | 0.993 | **0.015*** | **0.002**** | **0.001**** | 0.982 | **0.017*** | 0.891 | **<0.001***** | **0.021*** | **0.001**** |
| Hip Circumference (cm) | **s** | 0.049 | -0.036 | -0.043 | -0.080 | 0.021 | -0.025 | 0.003 | **-0.102** | 0.025 | **-0.089** |
| | **p** | 0.270 | 0.424 | 0.329 | 0.072 | 0.639 | 0.577 | 0.942 | **0.021*** | 0.569 | **0.044*** |
| Waist/Hip Ratio | **s** | -0.056 | **-0.158** | **-0.212** | **-0.154** | -0.011 | **-0.157** | 0.002 | **-0.203** | **-0.237** | **-0.129** |
| | **p** | 0.208 | **<0.001***** | **<0.001***** | **<0.001***** | 0.802 | **<0.001***** | 0.962 | **<0.001***** | **<0.001***** | **0.004**** |

*U: Mann-Whitney U Test; s: Spearman Rank Difference Correlation Coefficient, *p<0.05; **p<0.01; ***p<0.001, *BMI: Body Mass Index, *SAAS: Social Appearance Anxiety Scale*

SAAS total scores of study participants significantly affected FCQ's mood subfactor scores (β=3.689; t=2.271; p<0.05) and this model was significant (F=5.157; p<0.05) and they also significantly affected convenience subfactor scores (β=2.986; t=2.330; p<0.05) and this model was again significant (F=5.431; p<0.05). When the results were examined, it was found that a 1 unit increase in SAAS total scores increased mood and convenience subfactor scores of FCQ by 3.689 and 2.986 times, respectively (Table 3).

**Table 3.** The effect of SAAS total scores on FCQ sub factor scores

| Scores | Model | ß | Std. Error | t | p | F | $R^2$ |
|---|---|---|---|---|---|---|---|
| **Health** | (Fixed) | 31.818 | 3.972 | **8.010** | **<0.001***** | 0.235 | 0.001 |
| | SAAS | 0.650 | 1.341 | 0.484 | 0.628 | | |
| **Mood** | (Fixed) | 23.626 | 4.491 | **5.261** | **<0.001***** | 5.157 | 0.008 |
| | SAAS | 3.689 | 1.625 | **2.271** | **0.024*** | | |
| **Convenience** | (Fixed) | 25.640 | 3.527 | **7.271** | **<0.001***** | 5.431 | 0.009 |
| | SAAS | 2.986 | 1.281 | **2.330** | **0.020*** | | |
| **Sensory Appeal** | (Fixed) | 32.112 | 4.882 | **6.578** | **<0.001***** | 0.110 | 0.001 |
| | SAAS | 0.523 | 1.578 | 0.332 | 0.740 | | |
| **Natural Ingredients** | (Fixed) | 34.284 | 3.342 | **10.259** | **<0.001***** | 0.030 | 0.001 |
| | SAAS | -0.204 | 1.176 | -0.173 | 0.862 | | |
| **Price** | (Fixed) | 31.954 | 3.217 | **9.934** | **<0.001***** | 0.313 | 0.001 |
| | SAAS | 0.624 | 1.115 | 0.560 | 0.576 | | |
| **Weight Control** | (Fixed) | 33.585 | 2.728 | **12.313** | **<0.001***** | 0.002 | 0.001 |
| | SAAS | 0.055 | 1.121 | 0.049 | 0.961 | | |
| **Familiarity** | (Fixed) | 29.292 | 3.864 | **7.581** | **<0.001***** | 1.350 | 0.001 |
| | SAAS | 1.629 | 1.402 | 1.162 | 0.246 | | |
| **Ethical Anxiety** | (Fixed) | 29.984 | 2.389 | **12.549** | **<0.001***** | 2.638 | 0.003 |
| | SAAS | 1.720 | 1.059 | 1.624 | 0.105 | | |

*ß: Beta Coefficient; F: One-Way ANOVA Test; t: Independent Sample T Test, *p<0.05; ***p<0.001, * SAAS: Social Appearance Anxiety Scale*

It was found that there was a very weak positive correlation between the SAAS total scores of study participants and FCQ's mood and convenience subfactor scores ($p<0.05$). When the results were examined, it was found that as SAAS total scores increased, mood and convenience subfactor scores of FCQ increased by 9.8% and 10.6%, respectively (Table 4).

**Table 4.** Correlation coefficient between SAAS total scores and FCQ sub factor scores

| FCQ | SAAS | |
|---|---|---|
| | s | p |
| **Health** | 0.079 | 0.074 |
| **Mood** | **0.098** | **0.026*** |
| **Convenience** | **0.106** | **0.016*** |
| **Sensory Appeal** | 0.005 | 0.916 |
| **Natural Ingredients** | -0.004 | 0.928 |
| **Price** | 0.037 | 0.410 |
| **Weight Control** | 0.031 | 0.488 |
| **Familiarity** | 0.079 | 0.076 |

*s: Spearman Rank Difference Correlation Coefficient, *p<0.05, * SAAS: Social Appearance Anxiety Scale*

When the effects of gender and anthropometric measurement values on SAAS were examined, it was found that female had 5.149 times higher SAAS scores than male based on gender ($p<0.05$). In addition, the rate of plausibility of dependent variables by the independent ones was 2.3% (Table 5).

**Table 5.** The effect of gender and anthropometric measurements on SAAS

| Variable | | Unstandardized Coefficients | | | | %95 CI ß Confidence Interval | |
|---|---|---|---|---|---|---|---|
| (Fixed) | $R^2$ | ß | SE | t | p | Lower Limit | Upper Limit |
| | 0.023 | 16.153 | 5.435 | **2.972** | **0.003**** | 5.475 | 26.831 |
| **Gender (Ref: Male)** | | | | | | | |
| Female | | 5.149 | 1.613 | **3.192** | **0.001**** | 1.980 | 8.318 |
| BMI | | 0.161 | 0.220 | 0.731 | 0.465 | -0.271 | 0.593 |
| Waist circumference | | -0.020 | 0.095 | -0.214 | 0.831 | -0.208 | 0.167 |
| Hip circumference | | 0.066 | 0.075 | 0.890 | 0.374 | -0.080 | 0.213 |

*ß: Beta Coefficient, SE: Standard Error, **p<0.01, *BMI: Body Mass Index*

## DISCUSSION

In this study, it was found that BMI, mean waist/hip ratio and waist circumference health risk of male were higher than those of female. Likewise in the 2021 Açıkgöz et al. study; it was reported that the mean BMI of male was higher than female [26]. On the other hand, in a study performed by Sacko and Arslan among university students in 2022, it was found that waist circumference and mean BMI of female were higher than those of male [27]. This might be explained by the fact that female pay more attention to their body weight and nutrition due to reasons such as visual anxiety and body image than male and the fact that high waist circumference and waist/hip ratio are observed in male because of testosterone hormone dependent android type adiposity [28].

The majority of participants and mainly female skipped meals and the most skipped meal was lunch. In a similar study by Zemzemoğlu in 2019; it was found that female skip meals more frequently than male and the most skipped meal is lunch [29]. On the contrary, Akyol and Imamoğlu's study in 2019 found that male skip meals more frequently than female [30]. This could be explained by the fact that the reason for skipping lunch as the main meal is not to find time for lunch because of work-life [29].

In this study, it was determined that the majority of participants had lower social appearance anxiety and the median social appearance anxiety scale score of female was higher than that of male. On the contrary, in Şengönül's study in 2021, it was determined that the median social appearance anxiety scale score was higher in male than female [5]. In a study performed by athletes, it was found that male athletes' social appearance anxiety levels were higher than female ones [31]. This could be explained by the fact that more alternatives are offered to female in the aesthetic, fashion, and cosmetics sectors and their physical appearance is more intensely evaluated by society [28].

According to the food choice questionnaire; female had higher "Health", "Mood", "Convenience", "Natural Content", "Price", "Weight Control", "Familiarity", and "Ethical Concern" sub factor scores than male. In a study conducted by Uysal Yeler and Göktaş in 2023, it was found that "Sensory Appeal" and "Mood" are the most and "Ethical Concern" and "Weight Control" are the least favored food choice sub factors by female who take diet training [32]. This could be explained by the fact that female anxiety like physical appearance and maintaining body weight are more effective on their food choices [33].

In this study as BMI values increased, scores of "Mood", "Convenience", "Natural Content", "Weight Control" and "Ethical Anxiety" subfactors of the food choice questionnaire decreased. It was found that individuals who take diet training pay more attention to preferring healthy food in food choice, thus their BMI values are lower [32]. This could be explained by the fact that BMI increases in parallel to increased body weight and individuals pay attention to their food choices because of their anxiety over weight gain, and their care for factors like "Convenience", "Natural Content, "Weight Control" and "Ethical Concern" [13].

In this study, it was concluded that increased scores of the "Health", "Mood", "Convenience", "Natural Content", "Weight Control", "Familiarity", and "Ethical Anxiety" sub factors in individuals from the food choice questionnaire caused waist circumference and waist/hip ratio to decrease. Similarly, scores of "Sensory Appeal", "Natural Content" and "Health" sub factors were higher in people with normal [13]. This could be explained by the fact that individuals with low health risk in terms of waist circumference values are more informed about nutrition to maintain body weight and pay more attention to sub factors such as "Health", "Convenience", "Natural Content", "Weight Control", "Familiarity" and "Ethical Anxiety" [34].

In this study, it was concluded that increased "Weight Control" and "Ethical Anxiety" sub factor scores lead to lower hip circumference values. Likewise, in a study performed by Uysal Yeler and Göktaş in 2023, it was found that hip circumference values of those who take diet training are lower [32]. Higher hip circumference values were correlated with higher body weight. Therefore, this could be explained by the fact that individuals pay more attention to "Weight Control" and "Ethical Anxiety" to maintain body weight and not gain any [35].

In this study, it was found that, as scores of the "Social Appearance Anxiety Scale Total" increased, "Mood" and "Convenience" sub factor scores also increased. This might be due to the anxiety of gaining weight and the preference for applicable food that will not cause weight gain as a result of an increase in social appearance anxiety [34].

### Limitations

There are some limitations of our study. A high number of female participants in the distribution sample, and a high number of individuals with normal weight in the BMI group were the limitations.

## CONCLUSION

In conclusion, it was found that high social appearance anxiety affects an individual's food choices and body composition. Especially female and young individuals are more severely affected. This might lead to

an increased desire to be physically fit and as a result, eating disorders might develop. Awareness should be raised particularly at an early age and society should be educated about eating knowledge by experts to improve nutritional habits and gain healthy food choice habits.

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## REFERENCES

1. Yorulmaz M, Kurutçu Ş. Vücut algısı ve sosyal görünüş kaygısı ilişkisinin incelenmesi. Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi. 2019; 6(2):195-208.
2. Türker A, Er Y, Yavuz Eroğlu S, Şentürk A, Durmaz M. Spor yapan bireylerin sosyal görünüş kaygısı ve benlik saygısının incelenmesi. Muş Alparslan Üniversitesi Uluslararası Spor Bilimleri Dergisi. 2018; 2(1):8-15.
3. Erdoğan İ, Eryürek S, Ünübol H. Üniversite öğrencilerinde sosyal görünüş kaygısı ve yeme tutumu arasındaki ilişkinin incelenmesi. İnternational Journal of Social Science. 2019;2(2): 85-94.
4. Çetinkaya B, Gülaçtı F, Çiftçi Z. Lise öğrencilerinin sosyal görünüş kaygı düzeylerinin bazı değişkenlere göre incelenmesi. Uluslararası Toplum Araştırmaları Dergisi. 2019;10(17):905-922.
5. Şengönül M, Aydın BN. Genç yetişkinlerde sosyal medya kullanımına dair özellikler ile sosyal görünüş kaygısı ve yeme tutumu ilişkisi. Haliç Üniversitesi Sosyal Bilimler Dergisi. 2023;6(1):113-134.
6. Tayhan Kartal F, Kabakuş Aykut M. Üniversite öğrencilerinde sosyal fizik kaygısı ve depresyonun yeme bozukluğu riski ile ilişkisi. Beslenme ve Diyet Dergisi. 2019;47(2):20-29.
7. Reichenberger J, Radix AK, Blechert J, Legenbauer T. Further support for the validity of the social appearance anxiety scale (SAAS) in variety of German- speaking samples. Eating and Wheight Disordes-Studies on Anorexia, Blumia and Obesity. 2022;27(3):929-943.
8. Chen PJ, Antonelli M. Conceptual models of food choice: Influential factors related to foods, individual differences and society. Foods. 2020;9(12):1898.
9. Gillardini L, Cancello R, Caffetto K, Cottafava R, Gironi I, Invitti C. Nutrition knowledge is associated with greater weight loss in obese patients following a multidisciplinary rehabilitation program. Minerva Endocrinology. 2020;46(3):296-302.
10. Özdemir MÖ. Profesyonel futbolcularda sürekli kaygı ile covid-19 (korona) virüsüne yakalanma kaygısı arasındaki ilişkinin incelenmesi. Akdeniz Spor Bilimleri Dergisi. 2022;5(4):844-857.
11. Kanatsız D, Gökçe H. Ergenlerin fiziksel aktiviteye katılım durumuna göre beden memnuniyeti ve sosyal görünüş kaygısı düzeylerinin incelenmesi. Manas Sosyal Araştırmalar Dergisi. 2020;9(3):1863-1870.
12. Cunha LM, Cabral D, Mooura AP, Almedida MDV. Application of the food choice uestionnaire acros cultures; Systematic review of cross-cultural and single country studies. Food quality and preference. 2018;64:21-36.
13. Fisunoğlu M, Kesik F. Kadın tüketicilerin beden kütle indekslerinin besin seçim motivasyonları üzerine etkisinin incelenmesi. Hacettepe University Faculty of Health Sciences Journal. 2019;6(3):310-324.
14. Cohen J. Statistical power analysis for the behavioral sciences (2. baskı). Hillsdale, NJ: Erlbaum; 1988.
15. Yıldırım HH, Yıldırım S. Hipotez testi, güven aralığı, etki büyüklüğü ve merkezi olmayan olasılık dağılımları üzerine. İlköğretim Online. 2011;10 (3):1112-1123.
16. Champely S, Ekstrom C, Peter D, et al. Pwr: Basic Functions for Power Analysis. R package version; 2020.
17. Süt N. Sample size determination and power analysis in clinical trials. RAED Journal. 2011;3(1-2):29-33.
18. Baysal A. Beslenme ve diyet dergisi 2012: Genel bakış. Beslenme ve Diyet Dergisi. 2013;41(1):1-2.
19. Türkiye Beslenme Rehberi (TÜBER). T.C. Sağlık Bakanlığı, Ankara. 2022 [internet]. https://hsgm.saglik.gov.tr/depo/birimler/saglikli-beslenme-hareketli-hayat-db/Rehberler/T%C3%BCrkiye%20Beslenme%20Rehber%20(T%C3%9CBER)%202022.pdf, [Erişim tarihi: 07.02.2023].
20. World Health Organization. Body mass index [internet]. hptts://www.euro.who.int/en/healthtopics/diseaseprevention/nutrition/a-healthy-lifestyle/body mass-index-bmi, [Erişim tarihi: 23.02.2023].
21. Hart TA, Flora DB, Palyo SA, Fresco DM, Holle C, Heimberg RG. Development and examination of the social appearance anxiety scale. Assessment. 2008;15(1):48-59.
22. Doğan T. Sosyal görünüş kaygısı ölçeği"nin (SGKÖ) Türkçe uyarlaması: geçerlik ve güvenirlik çalışması. Hacettepe Üniversitesi Eğitim Fakültesi Dergisi. 2010;39(39):151-159.
23. Steptoe A, Pollard TM, Wardle J. Development of a measure of the motives underlying the selection of food: the food choice questionnaire. Appetite. 1995;25(3):267-284.
24. Dikmen D, İnan Eroğlu E, Göktaş Z, Barut Uyar B, Karabulut E. Validation of a Turkish version of the food choice questionnaire. Food quality and preference. 2016;52:81-86.
25. Choi J, Peters M, Mueller RO. Correlational analysis of ordinal data: from Pearson'sr to Bayesian polychoric correlation. Asia Pacific Education Review. 2010;11(4):459-466.
26. Açıkgöz A, Karaer Taştan S, Şahan AG. Sağlıklı beslenme ve obezite danışmanlığı birimine başvuran yetişkin bireylerde ailesel obezite varlığının bireydeki obezite durumuna etkilerinin incelenmesi. Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi. 2021;10(4):883-892.
27. Sacko D, Arslan M. Üniversite öğrencilerinin besin tüketim sıklığının değerlendirilmesi ve beslenme bilgi düzeylerinin beden kütle indeksi üzerine etkisinin incelenmesi: İstanbul Aydın Üniversitesi Örneği. Türkiye Diyabet ve Obezite Dergisi. 2022;6(2):169-176.
28. Tan M, Demir MS. Kadınlardaki statünün giyim üzerine etkisi: Elazığ örneği. Avrasya Uluslararası Araştırmalar Dergisi. 2021;9(29):187-205.
29. Zemzemoğlu TEA, Erem S, Uludağ E, Uzun S. Sağlık bilimleri fakültesi öğrencilerinin beslenme alışkanlıklarının belirlenmesi. Food and Health. 2019;5(3):185-196.
30. Akyol P, İmamoğlu O. Üniversite öğrencilerinde cinsiyete göre beslenme alışkanlıkları. Spormetre Beden Eğitimi ve Spor Bilimleri Dergisi. 2019;17(3):67-77.
31. Toprak N, Saraç L. Sporcuların sosyal görünüş kaygısı ve kilofobi düzeyleri arasındaki ilişkinin incelenmesi. Spormetre Dergisi. 2018;16(2):111-118.
32. Uysal Yeler G, Göktaş Z. Beslenme eğitiminin besin seçimi, kolesterol alım düzeyi ve vücut kompozisyonuna etkisi. Abant Sağlık Bilimleri ve Teknolojileri Dergisi. 2023;3(1):1-9.
33. Akman C, Yara F, Taşlı K. Üniversite öğrencilerinde vücut yağ oranının sosyal görünüş ve benlik saygısı arasındaki ilişkinin incelenmesi. Turkish Journal of Science and Health. 2021;2(1):176-183.
34. Nas S, Beyhan Y. Beden kütle indekslerine göre bireylerin diyet ürünleri kullanım durumlarının saptanması. Sağlık ve Yaşam Bilimleri Dergisi. 2021;3(3):151-158.
35. Albayrak Yaman Z, Ünal E. Bolu il merkezinde gençlik ve spor bakanlığına bağlı yurtlarda kalan üniversite öğrencilerinin beslenme bilgi düzeylerinin ve obezite/fazla kiloluluk sıklığının değerlendirilmesi. ESTÜDAM Halk Sağlığı Dergisi. 2021;6(3):296-309.