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How Picky Eating Shapes Well-Being, Sleep and Obesity: A Study Among Women

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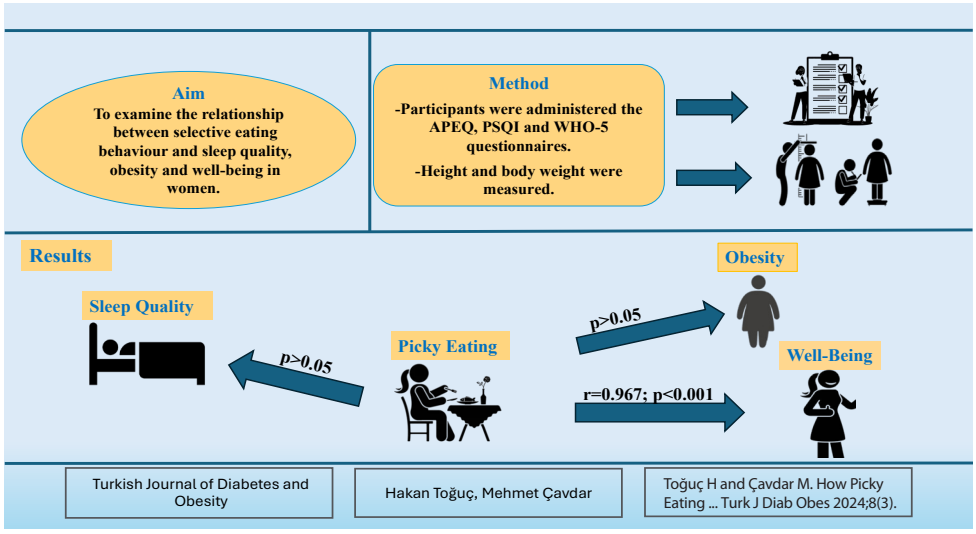
GRAPHICAL ABSTRACT



ABSTRACT

Aim: Picky eating behaviours are defined by negative attitudes towards certain foods and the restriction of food choices by these attitudes. This behaviour may be associated with obesity, sleep and quality of life. This study aims to examine the relationship between picky eating behaviour and sleep quality, obesity and well-being in women.

Material and Methods: A questionnaire including socio-demographic information, Adult Picky Eating Questionnaire (APEQ), Pittsburgh Sleep Quality Index (PSQI), and World Health Organization Well-being Index (WHO-5) was administered to 78 female participants and anthropometric measurements were taken. Pearson correlation was used to test continuous variable relationships, ANOVA and Kruskal-Wallis H multiple groups tests were used to compare multiple groups.

Results: The mean age of the participants was 41.0 ± 6.2 years, and the body mass index (BMI) was 26.7 ± 4.9 kg/m^2. 45.5% of the participants said they were well. There were strong positive correlations between picky eating behavior, food presentation, food variety, food indifference, taste status, and APEQ total score and well-being (r=0.775, p<0.001; r=0.728, p<0.001; r=0.681, p<0.001; r=0.624, p<0.001; r=0.967, p<0.001, respectively). In addition, no significant relationship was found between picky eating behavior and sleep quality (p > 0.05). There was a significant relationship between the age and BMI of the participants (p = 0.011). In addition, there was a significant relationship between the number of children and BMI (p = 0.003).

Conclusion: Picky eating behaviour improves quality of life by affecting well-being in women. In addition, new research on its effects on obesity and sleep is needed.

Keywords: *Picky eating, Sleep quality, Obesity, Well-being*

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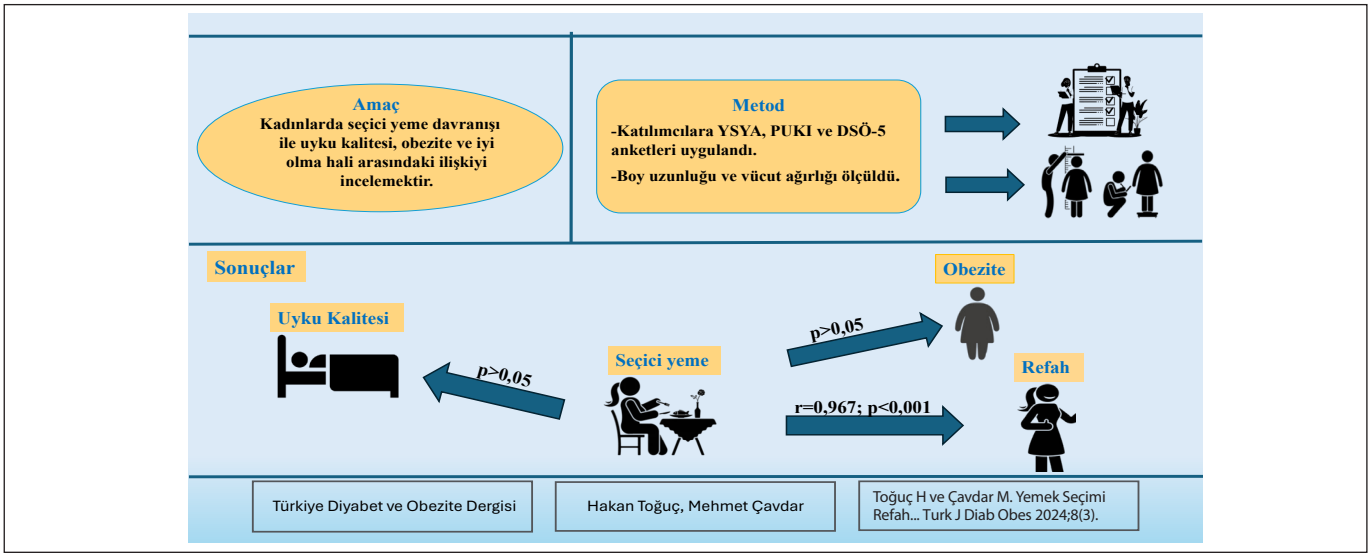
Yemek Seçimi Refah, Uyku ve Obeziteyi Nasıl Şekillendiriyor: Kadınlar Arasında Bir Çalışma

GRAFİKSEL ÖZET



ÖZ

Amaç: Seçici yeme davranışları, belirli gıdalara yönelik olumsuz tutumlar ve bu tutumların gıda seçimlerini kısıtlaması ile tanımlanmaktadır. Bu davranış obezite, uyku ve yaşam kalitesi ile ilişkili olabilir. Bu çalışmanın amacı kadınlarda seçici yeme davranışı ile uyku kalitesi, obezite ve iyi olma hâli arasındaki ilişkiyi incelemektir.

Gereç ve Yöntemler: Sosyo-demografik bilgiler, Yetişkin Seçici Yeme Anketi (YSYA), Pittsburgh Uyku Kalitesi İndeksi (PUKİ) ve Dünya Sağlık Örgütü İyi Oluş İndeksini (DSÖ-5) içeren bir anket 78 kadın katılımcıya uygulandı ve antropometrik ölçümler alındı. Sürekli değişken ilişkilerini test etmek için Pearson korelasyonu, çoklu grupları karşılaştırmak için ANOVA ve Kruskal-Wallis H çoklu grup testleri kullanılmıştır.

Bulgular: Katılımcıların yaş ortalaması 41,0 ± 6,2 yıl ve beden kütle indeksi (BKİ) 26,7 ± 4,9 kg/m^2 idi. Katılımcıların %45,5'u iyi olduğunu belirtmiştir. Seçici yeme davranışı, yiyecek sunumu, yiyecek çeşitliliği, yiyecek ilgisizliği, tat alma durumu ve YSYA toplam puanı ile iyi olma hâli arasında güçlü pozitif korelasyonlar vardı (sırasıyla r=0,775, p<0,001; r=0,728, p<0,001; r=0,681, p<0,001; r=0,624, p<0,001; r=0,967, p<0,001). Ayrıca, seçici yeme davranışı ile uyku kalitesi arasında anlamlı bir ilişki bulunmamıştır (p > 0,05). Katılımcıların yaşı ile BKİ arasında anlamlı bir ilişki bulunmuştur (p = 0,011). Ayrıca, çocuk sayısı ile BKİ arasında da anlamlı bir ilişki bulunmuştur (p = 0,003).

Sonuç: Seçici yeme davranışı kadınlarda iyi olma hâlini etkileyerek yaşam kalitesini artırmaktadır. Ayrıca, obezite ve uyku üzerindeki etkileri konusunda yeni araştırmalara ihtiyaç vardır.

Anahtar Sözcükler: *Seçici yeme, Uyku kalitesi, Obezite, İyilik hali*

INTRODUCTION

Picky eating behaviour is characterised by a limited and restricted diet and is increasingly recognised as a major concern with far-reaching effects on individual well-being. This behaviour can have profound effects on various aspects of an individual's life, including sleep, obesity risk and overall quality of life (1-3).

One of the most important aspects of selective eating behaviour is its association with psychological-based syndromes, especially eating disorders and obesity. In a study, it was found that binge eating and binge eating disorder behaviours were observed more frequently in individuals with selective eating behaviour (4). In another study, it was reported that the risk of anxiety increased in individuals with selective eating behaviour (5). Considering that eating behaviour is a social action, it has been emphasized that picky eating may cause individuals to avoid social environments and this may trigger social anxiety (6). In addition, it has been reported that individuals with binge eating disorder

frequently exhibit selective eating patterns that may lead to weight gain and obesity (2, 7). While the prevalence of this disorder varies between 2-5% in general population samples, it increases up to 30% in individuals seeking treatment for weight control (2).

The relationship between picky eating behaviour and sleep is also of concern. Individuals with picky eating behaviour may experience disturbances in their sleep patterns, potentially leading to problems such as insomnia, poor sleep quality and daytime fatigue (8). These sleep disturbances exacerbate sleep processes that are critical in maintaining physical and mental well-being, with negative effects on overall quality of life.

In addition, the psychological aspects of picky eating behaviour should not be ignored. This behaviour is frequently associated with depression, feelings of guilt and a general feeling of dissatisfaction about the individual's physical appearance and general health status (2,8).

MATERIALS and METHODS

This is a cross-sectional study conducted in a private physiotherapy clinic in Türkiye in September 2024. The research sample was calculated using the 'Raosoft Sample Size Calculator' programme with 95% confidence level and 5% margin of error, taking into account 88 participants who applied to the physiotherapy clinic between June and August 2024, and the minimum number of participants was determined as 72. At the end of the study, 84 participants were reached, but 8 participants withdrew from the study and as a result, 78 participants completed the study. General information questionnaire, Adult Selective Eating Questionnaire (APEQ), Pittsburgh Sleep Quality Index (PSQI), World Health Organisation Well-being Index (WHO-5) and anthropometric measurements were taken during face-to-face interviews with the participants.

Data Collection Tools

- APEQ: This scale, whose Turkish validity and reliability study was conducted by Ayyıldız and Esin, consists of 14 questions. The sub-dimensions of the scale consist of food presentation, food variety, indifference towards food, taste conditioning and EFQI total score. While Cronbach's Alpha value was 0.731 in the Turkish version of the scale, it was found to be 0.77 in this study (9).
- PSQI: The Pittsburgh Sleep Quality Index (PSQI) is a self-report tool used to assess sleep quality and disturbances over the past month. It consists of 7 components, each scored from 0 to 3, with a total score ranging from 0 to 21. A total score above 5 indicates poor sleep quality (10).
- WHO-5: This questionnaire, which was validated in Turkish by Eser et al. in 2019, expresses the well-being of the individual as a percentage. Percentage 0 represents the worst possible quality of life and 100% represents the best possible quality of life. The Kaiser-Meyer-Olkin test of the scale was 0.82 and Cronbach's Alpha value was 0.83, and the Cronbach's Alpha value of the scale was 0.80 in this study (11).
- Anthropometric Measurements: The height and body weight of the participants were assessed using the Tem Eko-300 device (Türkiye). Height was measured with the head positioned in the Frankfurt plane and the arms extended laterally. Body mass index (BMI) was calculated using the formula weight (kg)/height^2 (m^2).

Statistical Analysis

Data analysis was performed using IBM SPSS version 23.0. Descriptive statistics were reported as counts, percentages, means, and standard deviations. Normality assessment included examination of histograms, Q-Q plots, and skewness and kurtosis values within the range of ±1.00. Pearson correlation test was used to assess the relationship between continuous variables, and one-way analysis of variance and Kruskal-Wallis H test were used for comparisons between multiple groups. Bonferroni test was used for post-hoc. A p value of less than 0.05 was considered statistically significant.

RESULTS

General information of the participants is presented in Table 1. According to the findings, 56.4% of the women were university graduates, 41.0% had two children, 50.0% were housewives and 46.1% were in the pre-obesity category. The mean age of the women was 41.0±6.2 years and the BMI was 26.7±4.9 kg/m^2. According to the WHO-5, the mean well-being of the participants was calculated as 45.5±10.4%.

Details about the participants' picky eating behaviours and well-being are given in Table 2. The analyses showed that there was a strong and significant positive correlation between the participants' picky eating behaviours such as food presentation, food variety, indifference to food, taste conditions, and APEQ total score and well-being ($r=0.775$, $p<0.001$; $r=0.728$, $p<0.001$; $r=0.681$, $p<0.001$; $r=0.624$, $p<0.001$; $r=0.967$, $p<0.001$, respectively). However, no significant correlation was found between picky eating behaviours and sleep quality ($p>0.05$).

The associations between age, number of children, picky eating behavior, sleep quality, and obesity are shown in Table 3. The results showed that there was a significant relationship between the age of the participants and the BMI

Table 1. Baseline characteristics about the participants

Characteristics		Findings (n=78)
Education*	Primary Education	24 (30.8)
	High School	10 (12.8)
	University	44 (56.4)
Income Status*	Income less than expenditure	18 (23.0)
	Income and expenditure equal	47 (60.3)
	Income more than expenditure	13 (16.7)
Number of children*	1	13 (16.7)
	2	32 (41.0)
	3	22 (28.2)
	4	6 (7.7)
	5	5 (6.4)
Employment status*	Housewife	39 (50.0)
	Officer	29 (37.2)
	Student	8 (10.2)
	Other	2 (2.6)
BMI-category*	Weak	0 (0.0)
	Normal	28 (35.9)
	Overweight	36 (46.1)
	Class 1 (low-risk) obesity	10 (12.8)
	Class 2 (moderate-risk) obesity	2 (2.6)
	Class 3 (high-risk) obesity	2 (2.6)
Age (year±SD)		41.0±6.2
Height (cm±SD)		162.3±6.3
Weight (kg±SD)		70.2±11.2
BMI (kg/m2±SD)		26.7±4.9
WHO well-being (score±SD)		45.5±10.4

*Data are shown as n(%), **WHO:** World Health Organisation, **BMI:** Body Mass Index.

value (p=0.011). Post hoc analysis showed significant differences between the groups with BMI values of 18.5-24.9, 25.0-29.9 kg/m^2, and 30.0-34.9 kg/m^2 (p=0.021, p=0.024, respectively). In addition, a significant relationship was found between the number of children and the BMI value of the participants (p=0.003); post hoc analysis showed significant differences between the BMI 18.5-24.9 kg/m^2 group and the BMI 25.0-29.9 and 35.0-39.9 kg/m^2 groups (p=0.009, p=0.044, respectively).

Scores related to APEQ and its sub-dimensions are shown in Figure 1. Accordingly, food presentation score was 2.2±0.6, food variety score was 2.0±0.8, disinterest in food score was 2.7±0.9, conditions of taste score was 2.1±0.8 and APEQ total score was 2.3±0.5. According to the graph, when the total mean scores were taken into consideration, it was seen that the participants' disinterest in food was higher than other selective eating behaviours.

DISCUSSION

This study investigated the relationship between picky eating and sleep, obesity and quality of life in women in Tür-

Table 2. Relationship between picky eating and WHO-5 well-being index and sleep quality

Picky eating	WHO-5 Well-Being Index		Sleep Quality	
	r^P	p	r^P	p
Food presentation	0.775**	<0.001	0.026	0.823
Variety of nutrients	0.728**	<0.001	-0.032	0.780
Indifference to food	0.681**	<0.001	-0.008	0.943
Taste conditions	0.624**	<0.001	0.064	0.583
APEQ score	0.967**	<0.001	0.028	0.806

P: Pearson correlation test statistic, **WHO-5:** World Health Organization Well-being Index, **APEQ:** Adult Picky Eating Questionnaire, p<0.05.

Table 3. The relationship between age, number of children, picky eating, sleep quality and obesity

	BMI Category (n= 78)					
	18.5-24.9 kg/m^2	25.0-29.9 kg/m^2	30.0-34.9 kg/m^2	35.0-39.9 kg/m^2	>40 kg/m^2	p
Age(year±SD)	39.96±5.80^a	40.25±5.21^a	46.80±8.27^b	45.00±0.00	35.50±0.71	**0.011**^{F}
Number of children (n±SD)	1.89±0.74^a	2.75±1.02^b	2.70±1.42	4.00±0.00^b	2.50±0.71	**0.003**^{F}
Food presentation±SD)	2.21±0.61	2.32±0.57	2.06±0.62	2.43±0.00	2.50±0.99	0.697^F
Variety of nutrients (Median±SD)	1.98±0.79 (1.67)	1.99±0.73 (2.00)	1.87±1.06 (1.33)	2.00±0.00 (2.00)	3.16±0.23 (3.16)	0.332^{KW}
Indifference to food (Median±SD)	2.59±0.93	2.67±0.90	2.95±0.93	3.00±0.00	3.25±1.06	0.708^F
Taste conditions	2.25±0.78	2.01±0.78	2.20±0.82	2.50±0.00	2.00±0.00	0.721^F
APEQ score (Median±SD)	2.24±0.49	2.29±0.57	2.25±0.48	2.50±0.00	2.64±0.99	0.820^F
Well-being (score±SD)	45.08±10.41	45.14±11.05	45.29±10.53	49.71±0.00	54.23±3.30	0.778^F
Sleep quality (score±SD)	6.82±2.85	6.49±2.88	6.10±2.81	4.00±4.24	4.50±2.12	0.563^F

F: One Way Anova, **KW:** Kruskal Wallis, **WHO:** World Health Organisation, **BMI:** Body Mass Index, **APEQ:** Adult picky eating questionnaire, p<0.05.

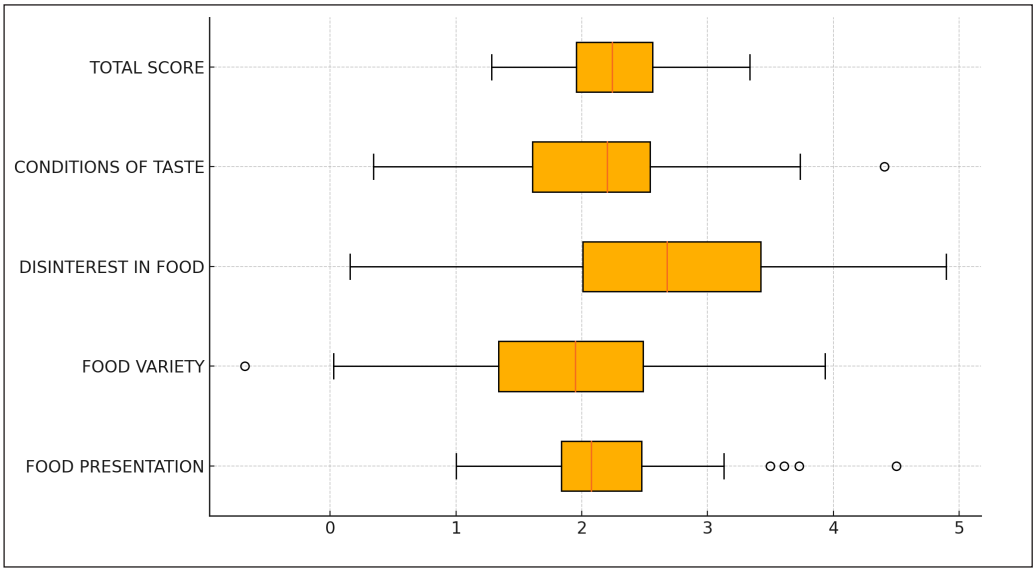


Figure 1: Information on participants' picky eating behaviours and sub-dimensions. Accordingly, food presentation score was 2.2±0.6, food variety score was 2.0±0.8, disinterest in food score was 2.7±0.9, conditions of taste score was 2.1±0.8 and APEQ total score was 2.3±0.5.

kiye. The mean BMI of the participants was 26.7±4.9 kg/m² and 46.15% of them were found to be pre-obese. This is consistent with the data of the Türkiye Nutrition and Health Survey-2017 (TBSA-2017), which showed that the mean BMI of women in our country was 28.9±6.4 kg/m² and 30.1% were pre-obese and 35.9% were obese (12). The results of the study seem to be compatible with the literature. In addition, 45.5±10.4% of the participants were found to be in a state of well-being, which indicates that obesity may significantly reduce quality of life with physical capacity deficiency, stigmatisation, depression and other health problems (13,14).

Picky eating behaviour is defined by the attitudes that individuals develop towards certain foods and the effects of these attitudes on food choices. This behaviour, which usually starts in childhood, can continue in adulthood and shapes eating habits (15). In this study, the relationship between picky eating and its sub-dimensions and quality of life was examined and it was found that participants with picky eating behaviour had a higher quality of life. Although this finding contradicts previous studies in the literature, it should be considered as an important finding. Studies have shown that picky eating behaviour is often associated with negative health outcomes. In a study conducted by Jacobi et al. it was reported that picky eating behaviour may lead to malnutrition and thus poor quality of life (16). However, the finding that individuals with picky eating behaviour had a higher quality of life in this study suggests that picky eating behaviour may be related not only with nutritional deficiencies but also with individuals' self-efficacy perceptions and conscious eating habits (17). Thus, it shows that a more conscious approach to food preferences and eating habits of individuals may positively affect quality of life. Birch and Fisher revealed that food selectivity in childhood may affect the long-term eating habits of individuals and these habits may be associated with healthy quality of life (18). In addition, a study by Keller et al. showed that adults with picky eating behaviours are more careful in their food choices and therefore may have a higher quality of life (19). The positive effects of picky eating behaviours on quality of life suggest that individuals being more picky in their food choices may have positive effects on their general health and well-being. In this context, developing conscious nutrition strategies and increasing the awareness of individuals about food choices may contribute to the improvement of quality of life.

The APEQ Cronbach's alpha value obtained in this study was 0.770. While this value was determined as 0.731 for the Turkish version of the scale, Cronbach's alpha value was determined as 0.874 in the Chinese version (9,20). These values are consistent with similar studies reported in the literature, indicating that the reliability of the versions of the scale in different languages and studies is preserved.

In this study, no significant relationship was found between the different dimensions of picky eating behaviour, namely food presentation, food variety, indifference to food, taste conditions and APEQ total score and sleep quality. Although this finding is partially consistent with previous studies, it reveals different results about the effects of picky

eating behaviours on sleep quality. Picky eating behaviours shape individuals' dietary patterns by affecting their attitudes and preferences towards certain foods (16). In general, inadequate or unbalanced diet may negatively affect sleep quality (21). However, the lack of a significant relationship between picky eating behaviours and sleep quality in this study suggests that these behaviours do not always have a direct effect on sleep patterns. Studies on the effect of factors such as food presentation and food variety on sleep quality are limited. Studies generally examine the effects of dietary habits on sleep through macro and micronutrient intakes. A study by St-Onge et al. showed that diets with high fat content may negatively affect sleep quality. However, in this study, more specific picky eating behaviours, such as disinterest in food and taste conditions, were not associated with sleep quality. These results suggest that the effect of picky eating behaviours on dietary habits may show individual differences and these differences may also change the effects of these differences on sleep quality (22). While picky eating behaviours of individuals may affect diet quality, it is possible that this effect does not always play an important role on sleep quality. This suggests that other variables such as general health status, stress levels, physical activity levels and genetic factors may be more determinant in sleep quality (23). In this study, it is thought that the fact that no relationship was found between the scores related to APEQ and its sub-dimensions and sleep quality may be due to methodological limitations such as the limited sample size, the fact that the participant group consisted only of women, and that the study was conducted in a single centre. It is considered that these factors may limit the generalisability of the study and prevent the detection of possible relationships between variables.

In this study, BMI of female participants was found to increase with increasing age. This finding supports the effects of the aging process on metabolic and body composition. In the literature, the trend of increasing body fat and decreasing muscle mass with age is frequently reported. These changes are associated with an increase in BMI and consequently with an increased risk of obesity (24).

During the ageing process, the basal metabolic rate usually decreases, leading to a decrease in energy expenditure. In women, the decrease in estrogen levels, especially in the postmenopausal period, may increase abdominal fat accumulation by affecting body fat distribution (25). As a result, weight gain may become more pronounced with age and this may increase BMI. This process is recognised as one of the main reasons for the increased prevalence of obesity in elderly individuals (26).

In this study, it was found that BMI increased as the number of children increased among female participants. This finding suggests that body weight gain and consequently obesity risk may increase in women with increasing number of children. In the literature, it has been reported that postnatal weight gain may have permanent effects on the long-term weight management of women (27). It has been reported that especially women who have more than one child have difficulty in postnatal weight loss and this may lead to an increase in BMI (28). In addition, increased responsibilities and time constraints brought about by having children may cause women not to spare enough time for themselves and to have difficulty in maintaining healthy eating habits (29). In this context, in order to prevent the risk of obesity in women with age, social awareness studies, nutritional recommendations and physical exercise should be encouraged.

Picky eating behaviour is characterised by individuals developing negative attitudes towards certain foods and shaping their eating habits accordingly (15). In this study, apathy towards food was found to be higher than other components of picky eating. This suggests that factors such as lack of motivation or lack of interest in specific foods may play an important role in picky eating behaviours. That is, a general disinterest in food may reduce the importance of factors such as food presentation and food variety. These findings are consistent with the study of Dovey et al. and emphasise that disinterest in food is a determining factor among picky eating behaviours (30). In addition, Taylor and Emmett reported that apathy towards food is common in childhood and this may negatively affect dietary diversity (31).

The findings of this study provide important data on the relationship between selective eating behaviours and health indicators such as quality of life, sleep and obesity in women. In the study, it was observed that body mass index increased with increasing age and number of children, suggesting that ageing and having children may increase the risk of obesity. It was determined that selective eating behaviours positively affected quality of life, but did not show a significant relationship with sleep quality. These findings provide important clues for future research to better understand the effects of selective eating behaviours on health. In order to increase the generalisability of the study, these effects should be examined not only in women but also in men and studies should be conducted in different age groups such as children, adolescents and the elderly. In addition, it is important to evaluate the differences in food preferences and the effects of picky eating behaviour in different socio-economic groups. In this context, further research is needed to reveal the positive and negative effects of picky eating be-

haviours in a more comprehensive manner. In particular, controlling BMI, which increases with increasing age and number of children, and promoting healthy eating habits may play a critical role in protecting the long-term health of women.

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Author Contributions
Hakan Toğuç was responsible for the conceptualization and design of the study. **Mehmet Çavdar** collected and analyzed the data. **Hakan Toğuç** also contributed to the interpretation of the results and the writing of the manuscript.

Conflict of Interest
This study has no conflicts of interest.

Funding
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Ethical Approval
The study received ethical approval from Inonu University Health Sciences Non-Interventional Clinical Research Ethics Committee in accordance with the Declaration of Helsinki (Ref. No: 2024/6365). Participants gave their voluntary consent in writing after receiving detailed information about the study.

Peer Review Process
Extremely and externally peer-reviewed and accepted.

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