Original Article / Araştırma Makalesi

EFFECT OF THE COVID-19 PANDEMIC ON EXERCISE, NUTRITIONAL BEHAVIORS AND PERCEIVED STRESS STATUS OF ADULTS

Covid-19 Pandemisinin Yetişkinlerin Egzersiz, Beslenme Davranışları ve Algılanan Stres Durumu Üzerine Etkisi

Esma AKSOY KENDİLCİ[1] 🆔   *Kenan KENDİLCİ*[2] 🆔   *Fatma KILIÇ*[3] 🆔   *Şeyma Şehadet TAŞDEMİR*[4] 🆔

[1,2,3,4]*Bitlis Eren University, Faculty of Health Sciences, Bitlis*

ABSTRACT

The aim of this descriptive study is to evaluate how the CovİD-19 pandemic has affected exercise, nutritional behaviors, and level of perceived stress in adults. 1037 people, 354 men and 683 women living in different regions in Turkey were reached. Quota sampling method was used. A questionnaire covering changes in socio-demographic information, dietary behaviors, and exercise status was used. The Perceived Stress Scale (PSS) was used. Data were collected by using the online survey method. The proportion of those who didn't exercise regularly during the quarantine period increased at a statistically significant level. The majority of the participants expressed that they made changes in their nutritional behaviors to protect themselves against the coronavirus. 48.7% of them stated that their desire to eat intensified during the quarantine period due to boredom and stress. Perceived Stress Scale mean score was higher in female participants compared to their male counterparts and this difference was statistically significant. If we as a society learn ways to cope with stress, we can prevent malnutrition behaviors that may occur due to changing emotional states. By providing information on special nutrition recommendations and home exercise practices in pandemics such as Covid-19; Energy intake can be balanced and people can be healthier.

Keywords: Covid-19, Exercise, Nutrition, Pandemic, Stress.

ÖZ

Bu tanımlayıcı çalışmanın amacı, yetişkinlerde Covid-19 salgınının egzersiz, beslenme davranışları ve algılanan stres düzeyini nasıl etkilediğini değerlendirmektir. Türkiye'nin farklı bölgelerinde yaşayan 354 erkek ve 683 kadın olmak üzere 1037 kişiye ulaşıldı. Kota örnekleme yöntemi kullanıldı. Veri toplamak için sosyo-demografik bilgilerin yanı sıra beslenme davranışları ve egzersiz durumundaki değişiklikleri kapsayan bir anket kullanılmıştır. Algılanan Stres Ölçeği (PSS) kullanıldı. Veriler, çevrimiçi anket yöntemi kullanılarak toplanmıştır. Karantina sürecinde düzenli egzersiz yapmayanların oranı istatistiksel olarak anlamlı düzeyde artmıştır. Katılımcıların çoğunluğu koronavirüsten korunmak için beslenme davranışlarında değişiklik yaptıklarını ifade etmiştir. %48.7'si karantina döneminde can sıkıntısı ve stres nedeniyle yemek yeme isteklerinin arttığını belirtmiştir. Kadın katılımcıların Algılanan Stres Ölçeği puan ortalaması erkek katılımcılara göre anlamlı ölçüde daha yüksek bulunmuştur. Toplum olarak stresle baş etme yolları öğrenirsek, değişen duygu durumuna bağlı oluşabilecek yanlış beslenme davranışlarını engelleyebiliriz. Covid-19 gibi pandemilerde özel beslenme önerileri ve evde egzersiz uygulamaları konularında bilgilendirme yapılarak; enerji alımını dengelenebilir ve insanların daha sağlıklı olması sağlanabilir.

Anahtar kelimeler: Beslenme, Covid- 19, Egzersiz, Pandemi, Stres.

Esma AKSOY KENDİLCİ ✉, eakendilci@beu.edu.tr
Bitlis Eren University, Faculty of Health Sciences, Bitlis

INTRODUCTION

A pneumonia epidemic of unknown etiology initially emerged in Wuhan, Hubei Province, China, in December 2019. Subsequently, the International Committee on Taxonomy of Viruses (ICTV) officially designated the virus responsible for the epidemic as "acute respiratory syndrome coronavirus 2 (SARS-CoV-2)" as the name of the virus that caused the outbreak (Memon, Pawase, Pavase & Soomro, 2021).

WHO has recommended that people follow healthy nutrition recommendations during the quarantine period in order so they can eat healthy during the COVID-19 pandemic. These general recommendations include the consumption of different vegetables and fruits by providing diversity in nutrition, salt and sugar restriction, moderate dietary fat consumption, reduction of alcohol consumption, and adequate fluid intake (WHO, 2022). FAO, which offered similar recommendations, also emphasized the consumption of whole grains, oilseeds, and oils rich in unsaturated fatty acids such as olive oil and sesame oil (FAO, 2020). In addition to these recommendations, the Turkish Dietetic Association has highlighted especially intake of high-quality animal protein since the consumption of high-protein foods (meat, eggs, fish, poultry, legumes, nuts, etc.) and dairy products (milk, yoghurt, ayran (a drink made of yoghurt and water), kefir, cheese, etc.) supports the immune system (Turkish Dietetic Association, 2020).

It was observed that the self-isolation precaution temporarily imposed by numerous countries to prevent infection adversely affected people's activities of daily living such as physical activity, nutrition, and sleep (Joseph et al., 2021; Jahrami et al., 2022). People turned to social media to follow the pandemic during quarantine. That consequently led to infection-phobia among the masses, to the point that incidence rates of anxiety, depression, and stress increased (Chen, Wang, Zhang & Tan, 2021).

Stress, which is one of the conditions that affect eating behavior, is a triggering factor for emotional eating. This triggering also has a negative effect on the consumed food preferences as well as diet quality by increasing the consumption of foods rich in sugar and fat (Barcın & Devrim, 2022). During the pandemic, particularly people's frequency of food consumption has changed and their consumption of fresh food has significantly decreased (Janssen et al., 2021).

Social isolation during the stay-at-home period, unbalanced and/or poor nutrition, and impaired eating behaviors contradict with the healthy diet strategies recommended during the pandemic. Emotional eating behavior, associated with especially stress and anxiety, is held responsible for this contradictory situation (Silva et al., 2021). However, the disruptions in the supply chain experienced at the beginning of the pandemic and the panic experienced by

consumers have also changed buying behaviors. People have accessed to fresh products in a relatively limited way and have increasingly tended to consume unhealthy foods with a long shelf life. (Robinson et al., 2021).

People ate more during quarantine, however, the quality of their diets dropped dramatically - hence explaining the spike in their BMIs (Body Mass Index) (Robinson et al., 2021). An increase in perceived stress during the quarantine period was associated with higher BMI and emotional eating (Barcın et al., 2022). Obese individuals have a decreased effectiveness of the immune system and become vulnerable to infections and their healing process is more difficult compared to non-obese individuals (Calder, 2021). Hospitalization, intubation, mechanical ventilation, lung involvement, comorbidity, length of stay in the intensive care unit, and mortality rates are higher in overweight and obese individuals. (Calder, 2021; Agca et al., 2021; Hendren et al., 2021). This makes it important to maintain a healthy body weight as well as eating behaviors during and after the pandemic.

Quarantine precautions used during the pandemic affected physical activity as well as increased stress levels and changes in diet (Al Hourani, Alkhatib & Abdullah, 2021). It was reported that doing physical activity regularly during the quarantine period was important in maintaining body weight (Jakobsson, Malm, Furberg, Ekelund & Svensson, 2020). Nonetheless, individuals stated that they became more inactive compared to the pre-pandemic period, especially due to the temporary shutdown of workplaces, schools, cafes, restaurants, and gyms as a result of remote working. The decreased level of physical activity adversely affected eating behaviors (Al Hourani et al., 2021). The aim of this study is to evaluate how the COVID-19 pandemic has affected exercise, nutritional behaviors, and level of perceived stress in adults.

MATERIAL AND METHOD

Population and Sample of the Study

This descriptive study was conducted between May and July 2020, and the research population comprises the adult population of Turkey. According to the 2019 data from the Turkish Statistical Institute (TUIK), Turkey's population is 83,154,997 people (TUIK, 2019).

Adults constitute 60 million 278 thousand 199 of this population. Given that 32.04% of individuals aged 18 and over are within normal limits of BMI according to the Turkey Nutrition and Health Survey (TBSA, 2010), the sample size was calculated as at least 944 people at the confidence interval of 99.9%. Quota sampling method was used. Table 1 shows the distribution

Effect of the Covid-19 Pandemıc on Exercise, Nutritional Behaviors and Perceived Stress Status of Adults.
Esma AKSOY KENDİLCİ, Kenan KENDİLCİ, Fatma KILIÇ, Şeyma Şehadet TAŞDEMİR

of the sample according to the 12 regions determined in the TUIK. 1037 people living in different geographical regions in Turkey were reached.

Table 1. The Distribution of the Sample by the Regions

REGION CODE	REGION NAME	Total population	Percent of adult population in total population (%)	Adult population	Number of samples	Number of Persons Reached
TRA	**Northeast Anatolia**	2200022	67.1	1475287	23	14
TRB	**Central Eastern Anatolia**	3930407	65.6	2577563	40	282
TRC	**Southeast Anatolia**	8975618	59.6	5346084	84	118
TR1	**Istanbul**	15519267	74.3	11527883	180	143
TR2	**West Marmara**	3601928	77.9	2842274	45	43
TR3	**Aegean**	10618433	77.1	8190138	128	110
TR4	**East Marmara**	8124975	74.7	6066467	95	65
TR5	**West Anatolia**	8124729	74.0	6014346	94	60
TR6	**Mediterranean**	10627530	71.1	7561333	118	73
TR7	**Central Anatolia**	4075758	73.0	2976450	47	48
TR8	**West Black Sea**	4666150	77.4	3610988	57	55
TR9	**East Black Sea**	2690180	77.7	2089386	33	26
TÜRKİYE		**83154997**		**60278199**	**944**	**1037**
Reference: TUIK, 2019						

Data Collection Tools

The researchers utilized a survey, compiled through a literature review, to collect data, encompassing socio-demographic information as well as changes in nutritional behaviors and exercise status. Participants were asked about exercising at least 150 minutes a week. In addition, the Perceived Stress Scale (PSS), developed by Cohen et al., (1983) and adapted into Turkish by Eskin et al. (2013), was used to assess the perceived stress level of the participants. There are also short forms of the scale, but the 14-item form was used in this study. The items in this scale examine what respondents think and feel in various situations they have faced in the last month. The options in the scale are easily understandable, the test is economical, easy, and quick to administer. It can be used in all segments of society. It is also not specific to any one situation. It is mainly sensitive to the interaction between the person and the environment. It measures participants' future expectations and their interaction with their immediate social environment. With the five-point Likert-type scale, the score obtained from the sum of the items determines the perceived stress level of the participants, and the maximum score that can be obtained from this scale is 56. In the evaluation of the scale, whose Turkish validity and reliability study has been carried out, 11-26 points indicate low-stress level, 27-41 points indicate moderate stress level, and 42-56 points indicate high stress level. The Cronbach's alpha

of the scale is 0.84 (Cohen, et al., 1983; Eskin, et al., 2013). Data were collected by using an online survey (Google Forms) method. All participants in the study were informed about the purpose of the study. Moreover, their online consent was duly obtained.

Statistical Analysis

The data were statistically analysed in the Statistical Package for Social Sciences (SPSS) 20.0 software. In the study, descriptive statistics (mean, standard deviation, number, and percentile) were given for categorical and continuous variables. Whether or not the data were normally distributed was evaluated by examining skewness and kurtosis values. The fact that the values are between +2 and -2 indicates that the data are normally distributed (Tabachnick & Fidell., 2013). According to these results, parametric tests were used to analyse the data. Student's t-Test and One-Way Analysis of Variance (ANOVA) were used. In addition, Bonferroni correction was applied for the significance value in Post Hoc analyses with more than 2 groups in the study. Correlations between categorical variables were analysed using Fisher's Exact Test, Chi-Square test, and McNemar's test. The levels of $p<0.05$ were accepted as statistically significant.

Ethical Considerations

The "Ethics Committee Approval" numbered 2020/04-VI and dated 15/05/2020 was obtained from the Non-Invasive Clinical Trials Ethics Committee of Bitlis Eren University for the study. The participants were informed about the aim of the study and that their personal information would be kept confidential and participation in the study would be based on voluntariness. The research was conducted in accordance with the Declaration of Helsinki.

RESULTS

In this section of the study, the findings obtained from the analyzes are presented. Table 2 shows the socio-demographic characteristics of the participants. Accordingly, their mean age was 33.21 ± 11.03. 65.9% of the participants were female, 50.6% were married, and 62.3% were Faculty/College graduates. 19.9% of them were healthcare professionals and 74.9% had a moderate level of income.

Table 2. The Distribution of the Participants in terms of Socio-Demographic Characteristics

		Number (n)	**Percentage (%)**
Gender	Female	683	65.9
	Male	354	34.1
Marital status	Married	525	50.6
	Single	464	44.8
	Divorced/Widowed	48	4.6
Educational background	Primary education	70	6.8
	High school	151	14.5
	College/Faculty	646	62.3
	Graduate	170	16.4
Being a healthcare professional	Yes	206	19.9
	No	831	80.1
Income level	High	73	7.1
	Moderate	777	74.9
	Low	187	18.0
TOTAL		**1037**	**100.0**
Mean age ± SD (Min-Max)		33.21 ± 11.03 (18-78)	

Table 3 shows the effect of the COVID-19 pandemic on the exercise status of the participants. Accordingly, while the rate of participants who did not exercise regularly before the quarantine was 5.2%, the rate of those who did not exercise regularly during the quarantine period increased to 22.9% (p<0.001).

Table 3. The Effect of The Covid-19 Pandemic on the Exercise Status of the Participants

	Do you exercise for at least 150 minutes a week during the quarantine period?						**p***
	Yes		**No**		**Total**		
	n	**%**	**n**	**%**	**n**	**%**	
Those who exercised for at least 150 minutes a week before the quarantine period	167	16.1	237	22.9	404	39.0	
Those who did not exercise for at least 150 minutes a week before the quarantine period	54	5.2	579	55.8	633	61.0	**<0.001**
Total	221	21.3%	816	78.7%	1037	100.0	

*McNemar test

Table 4 shows the opinions of the participants regarding their nutritional status during the Covid-19 pandemic. Accordingly, 63.3% of the participants stated that they thought that being overweight would pose a risk for coronavirus. While 64% of the female participants thought that being overweight would pose a risk for coronavirus, 61.9% of the male participants said "yes" to this question (p>0.05). While 56.6% of the participants thought that they were partially eating healthy, 6.6% stated that they did not think that they had a healthy diet (p>0.05). The majority of the participants (88.0%) stated that nutrition was effective for protection against the coronavirus. 5.4% of the female participants and 6.5% of the male participants thought that nutrition was not effective for protection against the coronavirus (p>0.05).

Table 4. The Gender-Based Distribution of the Answers Given by the Participants to Some Questions About Nutrition and the Coronavirus

	Female (n=683)		Male (n=354)		Total (n=1037)		p*
	n	%ᵃ	n	%ᵃ	n	%ᵃ	
Do you think that being overweight would pose a risk for the coronavirus?							
Yes	437	64.0	219	61.9	656	63.3	
No	90	13.2	51	14.4	141	13.6	0.777
I have no idea	156	22.8	84	23.7	240	23.1	
Do you think you have a healthy (adequate and balanced) diet?							
Yes	259	37.9	123	34.7	382	36.8	
Partially	378	55.3	209	59.1	587	56.6	0.523
No	46	6.8	22	6.2	68	6.6	
Do you think diet is effective for protection against the coronavirus?							
Yes	611	89.5	302	85.3	913	88.0	
No	37	5.4	23	6.5	60	5.8	0.106
I have no idea	35	5.1	29	8.2	64	6.2	
*Pearson's chi-square test , ᵃPercentage of the column							

Table 5 shows the gender-based distribution of changes in the participants' activities of daily living during the quarantine period. While 50.3% of the participants stated that their body weight did not increase during the quarantine period, 49.7% stated that their body weight increased (p>0.05). 48.7% of them stated that their desire to eat intensified during the quarantine period due to boredom and stress. While 54.8% of the female participants stated that their desire to eat intensified during the quarantine period due to boredom and stress, 37.2% stated that their desire to eat did not change. On the other hand, while 55.6% of the male participants stated that their desire to eat did not change, 37.0% stated that their desire to eat increased, and these differences between the genders were statistically significant (p<0.001). The majority of the participants (54.4%) stated that the time they spent in the kitchen during the quarantine period increased (p<0.001). During the quarantine period, 69.8% stated that the frequency of weighing themselves did not change. 25.6% of the female participants and 19.5% of the male participants stated that the frequency of weighing themselves increased. The difference between the genders was statistically significant (p<0.05). 31.6% of the female participants and 20.6% of the male participants stated that watching the news on the pandemic increased their stress levels considerably (p<0.001). The majority of the participants expressed that they made changes in their eating habits to protect themselves against the coronavirus (p>0.05).

Table 5. The Gender-Based Distribution of Changes in the Participants' Activities of Daily Living During the Quarantine Period

		Female (n=683)		Male (n=354)		Total (n=1037)		p
		n	%ᵃ	n	%ᵃ	n	%ᵃ	
Do you think your body weight increased during the quarantine period?	Yes	347	50.8	168	47.5	515	49.7	0.307*
	No	336	49.2	186	52.5	522	50.3	
How did the boredom and stress during the quarantine period affect your eating?	No I was not affected	254	37.2	197	55.7	451	43.5	<0.001*
	Yes, my desire to eat increased.	374	54.8	131	37.0	505	48.7	
	Yes, my desire to eat decreased.	55	8.0	26	7.3	81	7.8	
Is there any change in the time you spent in the kitchen during the quarantine period?	The time increased.	422	61.8	142	40.1	564	54.4	<0.001*
	No change	240	35.1	201	56.8	441	42.5	
	The time decreased.	21	3.1	11	3.1	32	3.1	
Is there any change in the frequency of weighing yourself during the quarantine period?	The frequency of weighing increased.	175	25.6	69	19.5	244	23.5	0.003*
	No change	454	66.5	270	76.3	724	69.8	
	The frequency of weighing decreased.	54	7.9	15	4.2	69	6.7	
How did watching the news on the pandemic affect your stress level?	Watching the news increased my stress level considerably.	216	31.6	73	20.6	289	27.9	<0.001**
	Watching the news increased my stress level.	353	51.7	163	46.0	516	49.7	
	Watching the news did not affect my stress level	110	16.1	115	32.5	225	21.7	
	Watching the news relieved my stress	4	0.6	3	0.9	7	0.7	
Have you changed your eating habits to protect yourself against the coronavirus?	Yes	553	81.0	273	77.1	826	79.7	0.144*
	No	130	19.0	81	22.9	211	20.3	

*Pearson's chi-square test, **Fisher's exact test, ᵃPercentage of the column

Table 6 shows the gender-based distribution of food consumed by the participants, whose desire to eat increased during the quarantine period. Accordingly, 42.9% and 40.3% of the participants stated to eat fruit and nuts, respectively. Most of those who ate sugar and sweets, pastries including white bread, nuts, carbonated beverages, fruit, and junk food (cakes, wafer bars, cookies, chips, etc.) were female.

Table 6. Gender-Based Distribution of Food Consumed of Participants Whose Desire to Eat Increased During the Quarantine Period

Foods Consumed	Female (n=683)		Male (n=354)		Total (n=1037)		p
	n	%[a]	n	%[a]	n	%[a]	
Fruit	274	61.6	171	38.4	445	42.9	**0.014***
Nuts	268	64.1	150	35.9	418	40.3	0.363
Junk food (cakes, wafer bars, cookies, chips, etc.)	237	66.4	120	33.6	357	34.4	0.850
Sugar and sweets	229	67.6	110	32.4	339	32.7	0.466
Pastries including white bread	201	70.3	85	29.7	286	27.6	0.075
Carbonated beverages	85	58.2	61	41.8	146	14.1	**0.045***

*Continuity Correction [a]Percentage of the row

Table 7 shows the comparison of the average level of perceived stress according to the socio-demographic characteristics of the participants and some variables. The average perceived stress level of the participants is 25.68. Accordingly, the PSS mean score was higher in female participants (26.46±5.49) compared to their male counterparts (24.17±5.11) and this difference was statistically significant ($p < 0.001$).

When examining the perceived stress level of the participants according to their educational background, the average level of perceived stress of high school graduates (24.52±5.34) was found to be statistically significantly lower than the level of those with college/faculty education (25.96±5.47) and graduate education (25.42±5.48) (p=0.015). PSS mean score of individuals with primary education (26.21±5.42) was statistically significantly higher than the score of those from the other education levels ($p < 0.05$).

Considering the perceived stress level of the participants according to their income status, the average level of perceived stress was statistically significantly higher in those with a low level of income (27.44±5.50) than those with high income (25.36±5.47) and moderate-income (25.28±5.38) ($p < 0.001$).

The PSS mean score of those with chronic disease (26.40±4.84) was higher than the PSS mean score of those without chronic disease (25.58±5.54). However, this difference is not statistically significant ($p > 0.05$).

When examining the perceived stress level of the participants according to the BMI classification, it was found that the average level of perceived stress was statistically significantly lower in overweight ones (24.26±5.36) than in underweight (27.71±4.17) and normal-weight individuals (26.06±5.52) ($p < 0.001$). The PSS mean score of obese individuals (26.96±5.16) was statistically significantly higher than the score of overweight ones (24.26±5.36) ($p < 0.001$).

The PSS mean score of the participants who were healthcare professionals (25.32 ±5.66) was lower than the PSS mean score of the non-healthcare professionals (25.77±5.42). However, this difference was not statistically significant (p>0.05).

Table 7. Comparison of the Average Level of Perceived Stress According to the Socio-Demographic Characteristics of the Participants and Some Variables

			Perceived Stress Level
			Mean±SD
Perceived Stress Level			25.68 ±5.47
Gender	**Male (n=354)**		24.17 ±5.11
	Female (n=683)		26.46 ±5.49
		Test Stat.	6.541
		p[1]	<0.001
Educational background	**Primary education (n=70)**		26.21±5.42
	High school (n=151)		24.52±5.34[a]
	College/Faculty (n=646)		25.96±5.47[b]
	Graduate (n=170)		25.42±5.48
		Test Stat.	3.181
		p[2]	0.023
Income level	**High (n=73)**		25.36±5.47[a]
	Moderate (n=777)		25.28±5.38[b]
	Low (n=187)		27.44±5.50[c]
		Test Stat.	12.123
		p[3]	<0.001
Presence of chronic disease	**Yes (n=123)**		26.40 ±4.84
	No (n=914)		25.58 ±5.54
		Test Stat.	1.553
		p[1]	0.087
BMI Classification	**Underweight (n=45)**		27.71±4.17[a]
	Normal (n=569)		26.06±5.52[a]
	Overweight (n=314)		24.26±5.36[b]
	Obese (n=109)		26.96±5.16[c]
		Test Stat.	12.446
		p[4]	<0.001
Being a healthcare professional	**Yes (n=206)**		25.32 ±5.66
	No (n=831)		25.77 ±5.42
		Test Stat.	1.054
		p[1]	0.292

[1]Student T- Test

[2]Bonferroni correction was made for One-Way ANOVA, Post-Hoc Analyses : p<0.0083 was considered as significant. [a-b] are different from each other

[3]Bonferroni correction was made for One-Way ANOVA, Post-Hoc Analyses: p<0.016 was considered as significant. [a-c] are different from each other, [b-c] are different from each other

[4]Bonferroni correction was made for One-Way ANOVA, Post-Hoc Analyses : p<0.0083 was considered as significant. [a-b] are different from each other, [b-c] are different from each other

DISCUSSION

One of the main objectives of this study is to evaluate exercise, nutritional behaviors, and perceived stress levels in society during the COVID-19 period. Numerous studies have been conducted on the effects of the COVID-19 pandemic and the associated stress on people's diets. It is important to reveal the mechanisms underlying stress-induced food preferences, especially

during the pandemic period, and to develop appropriate interventions (Shen, Long, Shih & Ludy, 2020). The studies have frequently highlighted that at-home exercise activities aiming to strengthen immunity and improve the current condition contribute positively to both the physical and psychological lives of people (Arslan & Ercan, 2020; Meltem & Bayar, 2020).

The rate of those who did not exercise during the quarantine period was statistically significantly higher. The rate of those who did not exercise during the quarantine period was statistically significantly higher than the pre-quarantine period. When studies with different sample groups in the literature were examined, it was concluded that the quarantine period reduced physical activity (Gürel & Ok, 2021; Küçükcankurtaran & Özdoğan, 2021; Özkan 2021; Yüce & Muz, 2021). These results are compatible with those of the present study.

More than half of the individuals stated that they did not exercise for at least 150 minutes a week before the COVID-19 quarantine period and this rate increased considerably during the pandemic period. A statistically significant difference was found between the exercise status of individuals before and during the pandemic (Kaner, Bozdağ, Ongan, Yurtdaş-Depboylu & Çalık, 2022), which is compatible with the present study.

In the study by Arancioglu et al. (Ozay-Arancioglu et al., 2021), the majority of the participants stated that their level of physical activity increased during the COVID-19 pandemic. Unlike the results of the present study, in their study, they determined that physical activity increased during the pandemic.

In the present study, most of the participants stated that they made changes in their eating habits to protect themselves against the coronavirus. There was no significant difference between the statuses of making changes in eating habits in order to be protected against the coronavirus in terms of gender. The studies have revealed that the eating habits of people have changed during the COVID-19 pandemic (Dilber & Dilber, 2020; Ozay-Arancioglu et al., 2021; Öztürk & Kolcu, 2022). Since the first wave of the COVID-19 pandemic, many governments have taken drastic security measures to keep their citizens at home. As a result, people from many countries have had to eat all their meals at home and change their physical activity habits (Ammar et al., 2020)

In a study conducted with 749 individuals in India in the early days of the pandemic, the participants declared that they spent more time in the kitchen and cooking during the quarantine period compared to the pre-quarantine period (Kumar & Dwivedi, 2020). In their study, Bozdag and Cakiroglu (Bozdag & Cakiroglu, 2021) observed that there was a significant increase in the frequency of food preparation/cooking and the time spent in the kitchen to prepare food in households during the COVID-19 pandemic.

Behavioral changes observed in individuals during the quarantine period affected their eating habits, as well. People tried to do different activities at home during this period in order to feel well psychologically and they started to engage in activities such as trying new recipes, spending more time with family members, cooking, and eating together. Due to these activities, the time spent in the kitchen significantly increased (Bozdag & Cakiroglu, 2021; Grunert et al., 2021). In this study, the majority of the participants stated that the time they spent in the kitchen during the quarantine period increased, which is compatible with the studies in the literature.

The quarantine period, together with decreased physical activity, may lead to stress and thus to an increase in unhealthy food consumption (Mediouni, Madiouni & Kaczor-Urbanowicz, 2020). As a matter of fact, in this study, nearly half of the participants stated that the boredom and stress they experienced during the quarantine period increased in their desire to eat. The studies in the literature reported that participants' moods changed during the COVID-19 pandemic, they ate more than pre-pandemic period, the number of their meals increased, and appetite and sugar craving increased (Macit, 2020; Almandoz et al., 2020; Sidor & Rzymski, 2020; Yüksel, 2021), which is compatible with the present study.

When examining the food preferences of individuals whose desire to eat increased during the quarantine period, the participants expressed that they consumed mostly fruit and nuts. It was determined that those who consumed sugar and sweets, pastries including white bread, nuts, carbonated beverages, fruit, and junk food (cakes, wafer bars, cookies, chips, etc.) were mostly female.

It has been observed that people's dietary preferences have changed due to the restrictions caused by the COVID-19 pandemic. Different studies revealed that when individuals were exposed to intense stress and anxiety, they tended to overeat to cope with this situation and consumed unhealthy foods such as high-energy chocolate, chips, junk food, pastries, fast food, or on the contrary, they increased the consumption of food groups such as vegetables and fruit to strengthen immune system (Çulfa, Yıldırım & Bayram, 2021; Dilber & Dilber, 2020; Macit, 2020).

In a study conducted by Yüksel (Yüksel, 2021) on athletes during the quarantine period, it was determined that nearly half of them decreased their vegetable consumption and consumed pastries more. In the study conducted by Yüce and Muz (Yüce & Muz, 2021) during the quarantine period, they determined that the amount of food consumed at lunch and consumption of sweets such as chocolate and dessert, pastries, and vegetables were statistically significantly higher in women when compared to men.

In the present study, nearly half of the participants expressed that their body weight increased during the quarantine period and there was no significant difference in terms of gender. Numerous studies in the literature reported that the body weight of people increased during the COVID-19 pandemic (Dilber & Dilber, 2020; Gürel & Ok, 2021; Ünal, Özdemir & Kaçan, 2020).

Unhealthy eating habits and physical inactivity are factors that cause weight gain. It was stated that it was necessary to raise awareness about the importance of adequate and balanced nutrition during the COVID-19 quarantine especially in preventing obesity (Aljohani & Al-Munawarah, 2020). Most people rarely experience mass quarantine. Therefore, it can be predicted that the boredom and stress caused by this situation may have different effects on appetite.

In the present study, the rate of the female participants who stated that watching the news during the pandemic greatly increased their stress levels was significantly higher than the rate of their male counterparts. There are different studies on this subject in the literature. In the study by Singh, it was reported that the eating status may change according to external and psychological stressors (Singh, 2014). It was revealed that high consumption of vegetables and fruit was associated with low levels of stress (El Ansari, Adetunji & Oskrochi 2014).

In the present study, the PSS mean score of the female participants was found to be significantly higher than the score of their male counterparts. Likewise, an Egyptian study reported similar results (Ammar et al., 2020). Although some other studies have indicated that women are more sensitive to stress (Al-Asadi, 2014; Aloğlu & Gecdi, 2021; Göksu & Kumcagiz 2021; Carpenter, Grecian & Reynolds, 2017; Kadıoğlu, Soylar & Güneş, 2021; Kulu Özsoy, Gürler & Özbeyli, 2020; Yüce & Muz, 2021), there are also studies reporting no relationship between gender and stress levels (Barrington, Beresford, McGregor, & White, 2014; Flesia et al., 2020; Pettit & DeBarr, 2011).

In the present study, the PSS mean score of those with chronic disease was higher than the PSS mean score of those without chronic disease. In the study by Hastaoğlu (Hastaoğlu, 2021), no significant correlation was found between the perceived stress levels of the participants with chronic diseases.

When examining the effect of educational background on perceived stress level, the average level of perceived stress was found to be significantly lower in high school graduates than in university graduates. In another study conducted with college students during the COVID-19 period, it was determined that the student's average PSS score was higher than the results of this study (Ertuğrul, Tekinyıldız & Alamur, 2021). Although another study conducted

during the pandemic period (Flesia et al., 2020) reported that education level was not an important indicator of perceived stress level, there are different studies on this subject in the literature (Qiu et al., 2020; Yan et al., 2021). In their study, Aloğlu and Gecdi reported that the perceived stress level decreased as the level of education increased (Aloğlu & Gecdi, 2021).

When examining the perceived stress level of the participants according to their income status in the present study, it was found that the average level of perceived stress level was significantly higher in those having a low level of income compared to those with high and moderate-income levels. In the study conducted by Bayar (Bayar, Can, Erten & Ekmen, 2021) on university students, they found that PSS total score was significantly higher in individuals with low levels of income.

When examining the perceived stress level of the participants in terms of BMI classification in the present study, it was determined that the average level of perceived stress was significantly lower in overweight ones compared to underweight and normal-weight participants. The PSS mean score of obese participants was higher than the score of the overweight ones. A study conducted during the one-month lockdown in Italy reported that BMI was higher in individuals who felt boredom/loneliness and anxiety/depression (Pellegrini et al., 2021).

The relationship between depression and body weight is explained by some physiological mechanisms. Especially changes in the production of proinflammatory cytokines or differences in the cerebral endothelium are thought to explain this mechanism (Slavich & Irwin, 2014). In their study, Beyhan and Erkut (Beyhan & Erkut, 2021) determined that the emotional eating people displayed during the COVID-19 pandemic resulted in weight gain due to excessive consumption of certain foods (high calories). A high BMI is a known risk factor for COVID-19. Appropriate methods should be found to prevent the motives that lead to emotional eating.

In the present study, the PSS mean score of the healthcare professionals was found to be lower than the score of those who were not healthcare professionals. However, this difference was not statistically significant. In a study, the perceived stress level of healthcare professionals was not found to be significant compared to the others (Pedrozo-Pupo, Pedrozo-Cortés & Campo-Arias, 2020). In a study conducted with healthcare professionals in the early days of the COVID-19 pandemic, it was observed that the majority of the participants had sub-threshold and mild psychological disorders, about a quarter of the participants had moderate psychological disorders, and a small percentage of healthcare professionals had serious psychological disorders (İzci, 2021). In a study conducted with dentists, their high PSS scores

indicated that they suffered from high stress due to COVID-19 and they had social anxiety for the future (Kulu et al., 2020). In another study, it was observed that more than half of healthcare professionals had a normal level of stress, and a small percentage of them suffered from a very high level of stress (Polat & Coşkun, 2020). In a similar study, the PSS mean score was found to be moderate (Aloğlu & Gecdi, 2021). The studies in the literature reported that the perceived stress level of healthcare professionals was high, which is different from the present study.

This study has some limitations in terms of examining the data only in the Turkish sample, self-reported data, and being conducted only on adults. This study has some strengths. It had a large sample size and it was determined by the quota sampling method according to the geographical regions of Turkey, all of which increases its reliability.

CONCLUSION AND RECOMMENDATIONS

The results of the study revealed that the majority of the participants made changes in their diet, their tendency to high-calorie foods (sugar and sweets, pastries, nuts, junk food(cakes, wafer bars, cookies, chips, etc.) increased, their exercise decreased, and their perceived stress was close to the medium level. A significant decrease in physical activity levels of people during the pandemic lockdown stage led to a positive energy balance and may have resulted in an increase in body weight, even if their dietary status did not change. In the present study, nearly half of the participants stated that their body weight increased due to the lockdown. The total energy intake of individuals should be balanced. Therefore, people should be informed about exercise, healthy recipes, and junk food through mass media. If we as a society learn ways to cope with stress, we can prevent wrong nutrition behaviors that may occur due to changing emotional states. By providing information on special nutrition recommendations and home exercise practices in pandemics such as COVID-19; Energy intake can be balanced and people can be healthier.

Acknowledgment

REFERENCES

Agca, M., Tuncay, E., Yıldırım, E., Yıldız, R., Sevim, T., Ernam, D. & Ozmen, I. (2021). Is Obesity a Potential Risk factor for Poor Prognosis of COVID-19?. *Infection & Chemotherapy,* 53(2), 319. https://doi.org/10.3947/ic.2021.0026

Al Hourani, H., Alkhatib, B. & Abdullah, M. (2021). Impact of COVID-19 Lockdown on Body Weight, Eating Habits, and Physical Activity of Jordanian Children and Adolescents. Disaster Medicine and Public Health Preparedness, 1–9. Advance online publication. https://doi.org/10.1017/dmp.2021.48

Al-Asadi, J. N. (2014). Perceived stress and eating habits among medical students. *International Journal of Medicine and Pharmaceutical Sciences,* 4(3), 81-90.

Aljohani, N. E. & Al-Munawarah, M. (2020). The effect of the lockdown for the Coronavirus (COVID-19) pandemic on body weight changes and eating habits in Saudi Arabia. *Journal of the Saudi Society for Food & Nutrition,* 13(1), 103-113.

Almandoz, J. P., Xie, L., Schellinger, J. N., Mathew, M. S., Gazda, C., Ofori, A. & Messiah, S. E. (2020). Impact of COVID-19 stay-at-home orders on weight-related behaviours among patients with obesity. *Clinical Obesity,* 10(5), e12386. https://doi.org/10.1111/cob.12386

Aloğlu, N. & Gecdi, T. (2021). Sağlık personelinin pandemi sürecinde duygu durumlarının bazı değişkenler (anksiyete-deprsyon ve algılanan stress) açısından İncelenmesi. *Gevher Nesıbe Journal Of Medıcal And Health Scıences,* 6(12), 29-39. https://doi.org/10.46648/gnj.196

Ammar, A., Brach, M., Trabelsi, K., Chtourou, H., Boukhris, O., Masmoudi, L. & ECLB-COVID19 Consortium. (2020). Effects of COVID-19 home confinement on eating behaviour and physical activity: results of the ECLB-COVID19 international online survey. *Nutrients,* 12(6), 1583. https://doi.org/10.3390/nu12061583

Arslan, E. & Ercan, S. (2020). Significance of exercise during Covid-19 pandemic and social distancing. *Spor Hekimliği Dergisi,* 55(2), 188-191.

Barcın-Güzeldere, H. & Devrim-Lanpir, A. (2022). The association between body mass ındex, emotional eating and perceived stress during covid-19 partial quarantine in healthy adults. *Public Health Nutrition,* 25(1), 43-50. https://doi.org/10.1017/S1368980021002974

Barrington, W. E., Beresford, S. A., McGregor, B. A. & White, E. (2014). Perceived stress and eating behaviors by sex, obesity status, and stress vulnerability: findings from the vitamins and lifestyle (VITAL) study. *Journal of the Academy of Nutrition and Dietetics,* 114(11), 1791-1799.

Bayar, B. D., Can, S. Y., Erten, M. & Ekmen, M. (2021). Covid-19 pandemi sürecinde üniversite öğrencilerinin depresyon ve stres düzeylerinin belirlenmesi. *Paramedik ve Acil Sağlık Hizmetleri Dergisi,* 2(1), 12-25.

Beyhan, Y. & Erkut, E. (2021). Pandemi Sürecinde Duygusal Yeme. *Haliç Üniversitesi Sağlık Bilimleri Dergisi,* 4(2), 109-114. https://doi.org/10.48124/husagbilder.848253

Bozdag, A. N. S. & Cakiroglu, F. P. (2021). Covid-19 outbreak and household food waste: Evidence from Turkey. *International Journal of Agriculture Environment and Food Sciences,* 5(3), 413-424. https://doi.org/10.31015/jaefs.2021.3.21

Calder P. C. (2021). Nutrition and immunity: lessons for COVID-19. *Nutrition & Diabetes,* 11(1), 19. https://doi.org/10.1038/s41387-021-00165-0

Carpenter, T., Grecian, S. M. & Reynolds, R. M. (2017). Sex differences in early-life programming of the hypothalamic–pituitary–adrenal axis in humans suggest increased vulnerability in females: a systematic review. *Journal of Developmental Origins of Health and Disease,* 8(2), 244-255.

Chen, Q., Li, M., Wang, Y., Zhang, L. & Tan, X. (2022). Changes in anxiety, depression, and stress in 1 week and 1 month later after the Wuhan shutdown against the COVID-19 epidemic. *Disaster Medicine and Public Health Preparedness,* 16(4), 1423-1430. https://doi.org/10.1017/dmp.2021.20

Cohen, S., Kamarck, T. & Mermelstein, R. (1983) A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.

Çulfa, S., Yıldırım, E. & Bayram, B. (2021). Covıd-19 pandemi süresince insanlarda değişen beslenme alışkanlıkları ile obezite ilişkisi. *Online Türk Sağlık Bilimleri Dergisi,* 6(1), 135-142. https://doi.org/10.26453/otjhs.798631

Dilber, A. & Dilber, F. (2020). Koronavirüs (COVID-19) Salgınının bireylerin beslenme alışkanlıkları üzerindeki. *Journal of Tourism and Gastronomy Studies,* 8(3), 2144-2162. https://doi.org/10.21325/jotags.2020.653

El Ansari, W., Adetunji, H. & Oskrochi, R. (2014). Food and mental health: relationship between food and perceived stress and depressive symptoms among university students in the United Kingdom. *Central European Journal of Public Health,* 22(2), 90-97. https://doi.org/10.21101/cejph.a3941

Ertuğrul, B., Tekinyıldız, E. & Alamur, M. (2021, December). Covıd-19 pandemi sürecinde algılanan stres ile kariyer iyimserliği ilişkisi: Üniversiteler için yol haritası. *Türkiye Klinikleri Sağlık Bilimleri Dergisi*, 7(3), 609-619. https://doi.org/10.5336/healthsci.2022-88522

Eskin, M., Harlak, H., Demirkıran, F. & Dereboy, Ç. (2013). Algılanan Stres Ölçeğinin Türkçeye Uyarlanması: Güvenirlik ve Geçerlik Analizi. *Journal of New Symposium*. 51(3): 132-140.

Flesia, L., Monaro, M., Mazza, C., Fietta, V., Colicino, E., Segatto, B. & Roma, P. (2020). Predicting perceived stress related to the Covid-19 outbreak through stable psychological traits and machine learning models. *Journal of Clinical Medicine,* 9(10), 3350. https://doi.org/10.3390/jcm9103350

FAO (Food and Agriculture Organization of the United Nations). (2020). Maintaining a healthy diet during the COVID-19 pandemic. http://www.fao.org/3/ca8380en/CA8380EN.pdf. Accessed 12 April 2020.

Göksu, Ö. & Kumcağız, H. (2020). Covid-19 Salgınında Bireylerde Algılanan Stres Düzeyi ve Kaygı Düzeyleri. *Electronic Turkish Studies,* 15(4), 463-479. https://dx.doi.org/10.7827/TurkishStudies.44397

Grunert, K. G., De Bauw, M., Dean, M., Lähteenmäki, L., Maison, D., Pennanen, K., Sandell, M. A., Stasiuk, K., Stickel, L., Tarrega, A., Vainio, A. & Vranken, L. (2021). No lockdown in the kitchen: How the COVID-19 pandemic has affected food-related behaviours. *Food Research İnternational (Ottawa, Ont.),* 150(Pt A), 110752. https://doi.org/10.1016/j.foodres.2021.110752

Gürel, S. & Ok, M. A. (2021). COVID-19 salgın sürecinin, sağlık eğitimi alan öğrencilerin beslenme alışkanlıkları, fiziksel aktivite ve vücut ağırlıkları üzerine etkisinin saptanması. *Başkent Üniversitesi Sağlık Bilimleri Fakültesi Dergisi-BÜSBİD,* 6(Özel Sayı), 01-15.

Hastaoğlu, E. (2021). Covid-19 salgını sürecinde turizm öğrencilerinin stres düzeyleri ve sağlıklı beslenme. *Journal of Tourism and Gastronomy Studies,* 9(3), 1610-1621. https://doi.org/10.21325/jotags.2021.858

Hendren, N. S., de Lemos, J. A., Ayers, C., Das, S. R., Rao, A., Carter, S., Rosenblatt, A., Walchok, J., Omar, W., Khera, R., Hegde, A. A., Drazner, M. H., Neeland, I. J. & Grodin, J. L. (2021). Association of body mass ındex and age with morbidity and mortality in patients hospitalized with covıd-19: Results from the american heart association covıd-19 cardiovascular disease registry. *Circulation,* 143(2), 135–144. https://doi.org/10.1161/CIRCULATIONAHA.120.051936

İzci, F. (2020). COVID-19 salgını ve sağlık çalışanları. *Anadolu Psikiyatri Dergisi*, 21(3), 335-3351.

Jahrami, H. A., Alhaj, O. A., Humood, A. M., Alenezi, A. F., Fekih-Romdhane, F., AlRasheed, M. M., Saif, Z. Q., Bragazzi, N. L., Pandi-Perumal, S. R., BaHammam, A. S. & Vitiello, M. V. (2022). Sleep disturbances during the COVID-19 pandemic: A systematic review, meta-analysis, and meta-regression. *Sleep Medicine Reviews,* 62, 101591. https://doi.org/10.1016/j.smrv.2022.101591

Jakobsson, J., Malm, C., Furberg, M., Ekelund, U. & Svensson, M. (2020). Physical activity during the coronavirus (covıd-19) pandemic: Prevention of a decline in metabolic and ımmunological Functions. *Frontiers in Sports and Active Living,* 2, 57. https://doi.org/10.3389/fspor.2020.00057

Janssen, M., Chang, B., Hristov, H., Pravst, I., Profeta, A. & Millard, J. (2021). Changes in Food Consumption During the COVID-19 Pandemic: Analysis of Consumer Survey Data From the First Lockdown Period in Denmark, Germany, and Slovenia. *Frontiers in Nutrition,* 8, 635859. https://doi.org/10.3389/fnut.2021.635859

Joseph, R. P., Pituch, K. A., Guest, M. A., Maxfield, M., Peckham, A., Coon, D. W., Kim, W. & Langer, S. L. (2021). Physical Activity Among Predominantly White Middle-Aged and Older US Adults During the SARS-CoV-2 Pandemic: Results From a National Longitudinal Survey. *Frontiers İn Public Health,* 9, 652197. https://doi.org/10.3389/fpubh.2021.652197

Kadıoğlu, B. U., Soylar, P. & Güneş, G. (2021). Üniversite Öğrencilerinin Koronavirüs Hakkındaki Bilgi, Tutum ve Davranışları İle Stres Düzeylerinin Değerlendirilmesi. *Sağlık Bilimlerinde Eğitim Dergisi,* 1(4), 36-49.

Kaner G., Bozdağ A. N. S., Ongan D., Yurtdaş-Depboylu G. & Çalık G. (2022). Evaluation of changing dietary habits of adults during covıd-19 pandemic Period. *Forbes Journal of Medicine,* 3(2), 131-138. https://doi.org/10.4274/forbes.galenos.2022.74745

Kulu, M., Özsoy, F., Gürler, E. B. & Özbeyli, D. (2020). COVID-19 salgınının diş hekimleri üzerinde yarattığı gelecek kaygısı ve stresin değerlendirilmesi. *Pamukkale Tıp Dergisi,* 14(1), 103-112.

Kumar, M. & Dwivedi, S. (2020). Impact of coronavirus imposed lockdown on Indian population and their habits. *International Journal of Science and Healthcare Research,* 5(2), 88-97.

Küçükcankurtaran, S. & Özdoğan, Y. (2021). Koronavirüs hastalığı'nın yetişkinlerin beslenme ve fiziksel aktivite durumuna etkisi; COVID-19 ve beslenme. *Düzce Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi,* 11(3), 318-324. https://doi.org/10.33631/duzcesbed.754560

Macit, M. S. (2020). Covid-19 salgını sonrası yetişkin bireylerin beslenme alışkanlıklarındaki değişikliklerin değerlendirilmesi. *Mersin Üniversitesi Sağlık Bilimleri Dergisi,* 13(3), 277-288.

Mediouni, M., Madiouni, R. & Kaczor-Urbanowicz, K. E. (2020). COVID-19: How the quarantine could lead to the depreobesity. *Obesity Medicine,* 19, 100255. https://doi.org/10.1016/j.obmed.2020.100255

Meltem, K. O. Ç. & Bayar, K. (2020). COVID-19 pandemisinde fiziksel aktivite ve egzersizin önemi. *Karya Journal of Health Science,* 1(2), 19-21.

Memon, S. U. R., Pawase, V. R., Pavase, T. R. & Soomro, M. A. (2021). Investigation of COVID-19 Impact on the Food and Beverages Industry: China and India Perspective. *Foods,* 10(5), 1069. https://doi.org/10.3390/foods10051069

Ozay-Arancioglu, I., Yilmaz, H. K., Basturk, B., Derya-Ipek, K., Yildirim-Mavis, C. & Bora, S. (2021). Evaluation of stress and nutrition status of university students during the covid-19 outbreak. *European Journal of Science and Technology,* (25), 707-714. https://doi.org/10.31590/ejosat.875539

Özkan, A. (2021). Covid-19 Salgın döneminde sağlıklı yaşam biçimi, fiziksel aktivite ve egzersizin rolü. *Başkent Üniversitesi Sağlık Bilimleri Fakültesi Dergisi-BÜSBİD,* 6(Özel Sayı), 56-72.

Öztürk, G. & Kolcu, M. (2022). Covid-19 pandemisinde 20-64 yaş arası 681 bireylerin sağlık algısı. İnönü Üniversitesi *Sağlık Hizmetleri Meslek Yüksekokulu Dergisi,* 10(2), 681-692. https://doi.org/10.33715/inonusaglik.1013509

Pedrozo-Pupo, J. C., Pedrozo-Cortés, M. J. & Campo-Arias, A. (2020). Perceived stress associated with COVID-19 epidemic in Colombia: an online survey. *Cadernos de Saude Publica,* 36. https://doi.org/10.1590/0102-311X00090520

Pellegrini, M., Ponzo, V., Rosato, R., Scumaci, E., Goitre, I., Benso, A. & Bo, S. (2020). Changes in weight and nutritional habits in adults with obesity during the "lockdown" period caused by the COVID-19 virus emergency. *Nutrients,* 12(7), 2016. https://doi.org/10.3390/nu12072016

Pettit, M. L. & DeBarr, K. A. (2011). Perceived stress, energy drink consumption, and academic performance among college students. *Journal of American College Health,* 59(5), 335-341. https://doi.org/10.1080/07448481.2010.510163

Polat, Ö. P. & Coşkun, F. (2020). COVID-19 Salgınında sağlık çalışanlarının kişisel koruyucu ekipman kullanımları ile depresyon, anksiyete, stres düzeyleri arasındaki ilişkinin belirlenmesi. *Batı Karadeniz Tıp Dergisi,* 4(2), 51-58. https://doi.org/10.29058/mjwbs.2020.2.3

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B. & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General Psychiatry,* 33(2). https://doi.org/10.1136/gpsych-2020-100213

Robinson, E., Boyland, E., Chisholm, A., Harrold, J., Maloney, N. G., Marty, L. & Hardman, C. A. (2021). Obesity, eating behavior and physical activity during COVID-19 lockdown: A study of UK adults. *Appetite,* 156, 104853. https://doi.org/10.1016/j.appet.2020.104853

Shen, W., Long, L. M., Shih, C. H. & Ludy, M. J. (2020). A humanities-based explanation for the effects of emotional eating and perceived stress on food choice motives during the COVID-19 pandemic. *Nutrients,* 12(9), 2712. https://doi.org/10.3390/nu12092712

Sidor, A. & Rzymski, P. (2020). Dietary choices and habits during COVID-19 lockdown: experience from Poland. *Nutrients,* 12(6), 1657. https://doi.org/10.3390/nu12061657

Silva, M. N., Gregório, M. J., Santos, R., Marques, A., Rodrigues, B., Godinho, C. & Freitas, G. (2021). Towards an In-Depth Understanding of Physical Activity and Eating Behaviours during COVID-19 Social Confinement: A Combined Approach from a Portuguese National Survey. *Nutrients,* 13(8), 2685. https://doi.org/10.3390/nu13082685

Singh, M. (2014). Mood, food, and obesity. *Frontiers in Psychology,* 5, 925. https://doi.org/10.3389/fpsyg.2014.00925

Slavich, G. M. & Irwin, M. R. (2014). From stress to inflammation and major depressive disorder: a social signal transduction theory of depression. *Psychological Bulletin,* 140(3), 774. https://doi.org/10.1037/a0035302

Tabachnick B. G. & Fidell L. S. (2013). Using multivariate statistics (5th ed.). New York: Allyn and Bacon.

TBSA (2010), Türkiye Beslenme Ve Sağlık Araştırması: Beslenme Durumu ve Alışkanlıklarının Değerlendirilmesi Sonuç Raporu.

TUIK (2019), "Adrese Dayalı Nüfus Kayıt Sistemi Sonuçları: 2019", www.tuik.gov.tr

TDA (2022), Turkish Dietitians Association: COVID-19 Nutrition Advice. http://www.tdd.org.tr/index.php/duyurular/69-covid-19-beslenme-onerileri. Accessed 18 September 2022.

Ünal, E., Özdemir, A. & Kaçan, C. Y. (2020). Covid-19 pandemisinin hemşirelik öğrencilerinin beslenme ve hijyen alışkanlıklarına etkisi. *Uludağ Üniversitesi Tıp Fakültesi Dergisi,* 46(3), 305-311. https://doi.org/10.32708/uutfd.791891

WHO (2022) World Health Organization Coronavirus (COVID-19) Dashboard. https://covid19.who.int/ Accessed 18 September 2022.

Yan, S., Xu, R., Stratton, T. D., Kavcic, V., Luo, D., Hou, F. & Jiang, Y. (2021). Sex differences and psychological stress: responses to the COVID-19 pandemic in China. *BMC Public Health,* 21(1), 1-8.

Yüce, G. E. & Gamze, M. U. Z. (2021). COVID-19 pandemisinin yetişkinlerin diyet davranışları, fiziksel aktivite ve stres düzeyleri üzerine etkisi. *Cukurova Medical Journal,* 46(1), 283-291.

Yüksel, A. (2021). Covid-19 Pandemi döneminde elit sporcuların uyku kalitesi ile beslenme durumunun değerlendirilmesi. *OPUS International Journal of Society Researches,* 17(Pandemi Özel Sayısı), 3918-3942. https://doi.org/10.26466/opus.909434