Araştırma Makalesi – Original Article

Determination of Nutrition Exercise Behaviors of Adolescents and Young Adults in the COVID-19 Pandemic*

COVID-19 Pandemisinde Adölesan ve Genç Erişkinlerin Beslenme Egzersiz Davranışlarının Belirlenmesi

Çiğdem Sarı Öztürk[i], Çiğdem Ceylan[ii]

[i]Res.Asst.Dr., Gazi University, Health Sciences Faculty, Nursing Department, https://orcid.org/0000-0001-8203-5925

[ii]Asst.Prof.Dr., Bolu Abant İzzet Baysal University, Health Sciences Faculty, Nursing Department, https://orcid.org/0000-0002-9015-5684

ABSTRACT

Objective: This study was conducted to determine the nutrition exercise behaviors of adolescents and young adults during the COVID-19 pandemic.

Materials and Methods: A cross-sectional study was conducted using an online questionnaire between 30 December 2020 and 30 January 2021. In the study, 1173 subjects aged 13-24 years participated. Data were collected by a descriptive features form, which consists of two modules evaluating sociodemographic characteristics and nutritional exercise behavior, and Nutrition Exercise Behavior Scale.

Results: Of the participants, 34.5% were adolescents and 65.5% were young adults. In addition to gaining more weight in women aged 19-25, it was reported that there was an increase in the number of harmful snacks and fast food consumed daily. Most of the participants stated that they did less than 30 minutes of physical activity. Height, weight, and BMI mean score of participants during the COVID-19 increased when compared with the mean score obtained before the pandemic (Z=−14.20; Z=−14.43; Z=−12.00, p <0.05). The mean total Nutrition-Exercise Behavior Scale score was 146.46±20.25 (Min:79, Max:205). It was determined that Body Mass Index, leisure screen time, and screen time during the pandemic were associated with Nutrition-Exercise Behavior Scale ($p < 0.001$).

Conclusion: The study highlights that confinement may affect nutrition-exercise behaviors of both adolescents and young adults.

Keywords: Adolescent, SARS-CoV-2, feeding behavior, exercise, young adult.

ÖZ

Amaç: Bu çalışma, COVID-19 pandemisinde adölesanlar ve genç erişkinlerin beslenme ve fiziksel aktivite davranışlarını belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Kesitsel tanımlayıcı tipteki çalışma 30 Aralık 2020 ile 30 Ocak 2021 tarihleri arasında çevrimiçi anket kullanılarak yapılmıştır. Çalışmaya 13-24 yaş arası 1173 kişi katılmıştır. Verilerin toplanmasında sosyodemografik özellikler ve beslenme egzersiz davranışını değerlendiren iki modülden oluşan tanımlayıcı özellikler formu ve beslenme egzersiz davranışları ölçeği kullanılmıştır.

Bulgular: Katılımcıların %34.5'i adölesan, %65.5'i genç yetişkinlerdir. 19-25 yaş arası kadınlarda daha fazla kilo almanın yanı sıra günlük tüketilen zararlı atıştırmalık ve fast food beslenme sayısında artış olduğu belirlenmiştir. Katılımcıların çoğu 30 dakikadan daha az fiziksel aktivite yaptıklarını ifade etmiştir. Katılımcının pandemi döneminde boy, kilo ve beden kitle indeksi ortalama puanlarının pandemi öncesine göre arttığı tespit edilmiştir (Z=-14.20; Z=-14.43; Z=-12.00, p <0.05). Beslenme Egzersiz Davranışları Ölçeği ortalaması 146.46±20.25 (Min:79, Maks:205)'dir. Beden Kitle İndeksi ve ekran süresiyle Beslenme Egzersiz Davranışları Ölçeği arasında önemli ilişki tespit edilmiştir ($p < 0.001$).

Sonuç: Çalışma, pandemi dönemindeki sınırlamaların adolesan ve genç erişkinlerin beslenme-egzersiz davranışlarını etkileyebileceğini vurgulamaktadır.

Anahtar Kelimeler: Adölesan, SARS-CoV-2, beslenme davranışı, egzersiz, genç erişkin

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İletişim - Correspondence Author: Çiğdem Sarı Öztürk <cigdemsarii@hotmail.com>
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Introduction

COVID-19 has affected 221 countries and approximately 125 million COVID-19 cases were reported worldwide On March 24, 2021.[1] Turkey was reported to have approximately three million cases of COVID-19 by the Ministry of Health.[2] According to the state of the pandemic, the government had to take measures, which have resulted in many limitations on daily life, such as home confinement.[3] As in all countries, home confinement was one of the fastest actions taken in Turkey to avoid the spread of the virus. One of the groups most affected by this condition has been adolescents and young adults.[4]

In the Covid-19 pandemic, it is of great importance for physical and mental health that people continue to spend energy while staying away from social environments due to quarantine.[5] In one study, it was determined that the period of sitting still during the day increased from five hours to eight hours in pandemic restrictions.[6] Staying at home and/or working at home during the pandemic can affect individuals' food choices, physical activity, and screen time. The pandemic process can also cause such feelings as fear, anxiety, sadness, and sleep problems in humans. In addition, social life restrictions can increase the screen time.[7] For this reason, WHO published a guide on what to do at home during the pandemic and quarantine process.[1]

In addition to emotional effects, changes screen time, and reduced physical activity, changes in diet can also occur during the pandemic process. Individuals' meal preferences may change, and there may be an increase or decrease in the number of meals. However, during the pandemic period, there is a need for herbal foods, healthy fats, and diets that are restricted from fat but rich in protein.[8] For this reason, nutrition and all factors that will affect eating habits of individuals and preferences during the pandemic are important factors that should be considered.

When the literature is examined, there are studies investigating lifestyle and eating habits separately in adults and children during the pandemic.[9-11] However, determining how screen time, physical activity, and nutritional habits change in both adolescents and young adults will be important in health education for the young population. To that end, we think that this article will fill an important gap in terms of examining the changes in screen time, eating habits, and physical activity during the COVID-19 pandemic by covering adolescents and young adults together.

Research Questions

1. Has the COVID-19 confinement led to dietary and lifestyle changes in adolescents and young adults?

2. Has the COVID-19 pandemic process affected anthropometric measurements of adolescents and young adults?

Material and Methods

Design

A cross-sectional, retrospective, and national web-based online study was conducted between 30 December 2020 and 30 January 2021 to evaluate the effects of nationwide confinement on changes in nutritional and physical activity behaviors in Turkey. Snowball sampling method was used in this study. The STROBE (Strengthening the Reporting of OBservational studies in Epidemiology) checklist was followed to guide this article (see Supplementary file).

Sample and Setting

This study was conducted while schools, cafes, and most entertainment centers were closed in the country. Primary data was collected from seven regions in Turkey. The survey was created as an anonymous online survey in Google Forms. The researchers sent the survey web-link to participants via social media tools (Twitter®, Instagram®, Facebook®, Whatsapp®). It took approximately six to ten minutes to complete the survey.

The inclusion criteria of this study are as follows: adolescents and young adults aged 13-24 years, being a high school or university student, living in Turkey and volunteering to participate. We reached 1181 participants through Google Forms. The age of the participants was selected as 13-25. Since the World Health Organization has declared that the upper limit for young adulthood can be accepted as up to 14 years of age and the developmental theorist Ericson is up to 25 years old, the upper limit age is accepted as 25 in our study.[12,13] On the other hand, age 13 (middle adolescent period) was accepted as the lower limit because it is the period when the concrete process period for Piaget's cognitive development has been completed and the abstract process period has begun.[13]

The results of the online survey were reviewed every day, and those who were not in the specified age range were not included in the study. We excluded eight participants because of not meeting inclusion criteria Accordingly, the sample size of this study was 1173 participants.

Procedures

At the beginning of the online survey, participants were informed about the aim of this study, and they were given the choice to volunteer or not. They participated by completing the survey and we thanked them with a note at the end. Participants were also encouraged to invite new participants from their areas. All the researchers participating in the study signed the Helsinki Declaration. Ethical approvals were obtained from Bolu Abant İzzet Baysal University Ethical Committee of (15.11.2020 /protocol number: 2020/257). All responses were provided with informed consent.

Data Collection

Data collection was performed through an online questionnaire divided into modules: the sociodemographic (age, gender, educational status, presence of chronic disease, diagnosis of COVID-19, and socio-demographic characteristics of the family), and anthropometric changes (weight, height, and body mass index (BMI)) before and during the pandemic. Self-reported weight and height were used to calculate BMI as weight in kilograms divided by height in meters squared. The participants were asked about their height and weight measurements in 2019 and their last height-weight measurements in 2020 when the study was implemented. Height, weight measurements and nutrition-exercise habits are based on participants' self-reports.

The second module includes dietary and physical activity change patterns during confinement. In this module, variables used to create patterns were changes of meals per day, drinking water, food consumption (healthy snack, harmful snack, sugar, fast food), screen time, and physical activity at home. These variables were re-categorized as increased, same as before, and decreased. The first two modules were created in line with the literature.[7,14,15]

Online questionnaires were sent to eight experts working on nutrition and physical activity. The suitability of the survey questions was evaluated. In line with the expert opinions, the survey was s implemented. The last module comprised of Nutrition Exercise Behavior Scale.

Nutrition Exercise Behavior Scale (NEBS)

This scale was developed by Yurt et al.[15] The scale is a five-point Likert-type scale consisting of 45 items, and its scoring is as:" describes me greatly =5,'' ''describes me well=4,'' ''somewhat describes me=3,'' ''describes me a little =2,''and ''does not describe me at all=1". The scale has four subscales: 1) Psychological/addictive eating behavior 2) Healthy nutrition-exercise behavior 3) Unhealthy nutrition-exercise behavior 4) Meal scheme. The Cronbach's alpha value of the scale was 0.85.[15]

Data Analysis

Data were analyzed with SPSS for Windows (SPSS 20.0, Chicago, IL, USA). Normal distribution of the data was determined using Kolmogorov-Smirnov test. Percentages, arithmetic means, and standard deviations were used for descriptive analysis. Comparison of non-normally distributed variables was done using Mann-Whitney U Test and Kruskal-Wallis Test.

Wilcoxon signed-rank test was used to compare weight, height and BMI pre and during pandemic. Correlation analysis, called Spearman, was used to investigate the relationship between subscales of NEBS and adolescents' and young adults' BMI, education level, and screen time. Multiple linear regression analysis was used for the variables predicting the adolescents and young adults' NEBS. Statistical significance was accepted as $p < .05$.

Results

Characteristics of Adolescents and Young Adults

The defining characteristics of adolescents and young adults and Nutrition Exercise Behavior Scale (NEBS) scores are given in ***Table 1***. Among the participants, 34.5% were adolescent, 65.5% were young adults. The mean age of the participants was 19.27 ± 2.82, and 76 % were female and 24 were male. Most of the participants (88%) did not have a chronic disease and COVID-19 diagnosis before. Most of the participants did less than 30 minutes of physical activity. Also, 80% of the participants stated that they do not use mobile applications for nutrition and 61% for physical activity. The scores of NEBS ranged from 79-205 and the mean score was 146.46±20.25. The mean scores of the meal scheme, psychological/addictive eating behavior, healthy nutrition-exercise behavior and unhealthy nutrition-exercise behavior subscales were 20.77±5.07, 64.63±10.09, 44.43±10.66, and 46.62±7.70, respectively.

Lifestyle Changes in COVID-19 Confinement and NEBS Scores

An analysis of lifestyle changes by gender, age groups and educational level is shown in ***Table 2***. Significantly more females reported an increase in all of the lifestyle changes ($p = 0.000$). Except for water and sweet consumption, there was no significant relationship between different education levels and lifestyle changes. It was determined that water and sugar consumption increased more in the 19-25 age group who had education at the university level. In addition, those aged 19-25 reported that they gained more weight and increased the number of harmful snacks and fast food meals consumed daily ($p = 0.001$, $p = 0.042$ and $p = 0.042$, respectively).

Table 1. Demographic characteristics of study participants and nutrition exercise behaviors scale scores (n=1173)

Variables	**M±SD**		**Min-Max**	
Age	19.27±2.82		13-25	
Meal scheme	20.77±5.07		6-30	
Psychological/addictive eating behavior	64.63±10.09		11-55	
Healthy nutrition-exercise behavior	44.43±10.66		14-70	
Unhealthy nutrition-exercise behavior	46.62±7.70		20-65	
Nutrition Exercise Behavior Scale	146.46±20.25		79-205	
Screen time	7,49±3,85		0.5-22	
Leisure screen time	4.55±2.94		0.5-22	
Characteristics	**n**	**%**	**NEBS**	**P**
Age				
13-18	405	34.5	160421.500[a]	0.374
19-25	768	65.5		
Gender				
Female	891	76	126704.500[a]	0.829
Male	282	24		
Education level				
University	753	64.2	153122.500[a]	0.368
High school	420	35.8		
Mother's education level				
Primary	808	68.9		
High school	250	21.3	2519[b]	0.284
University	115	9.8		
Father's education level				
Primary	579	49.4		
High school	347	29.6	2151[b]	0.341
University	247	21.1		
Chronic illness				
Yes	58	4.9	38857.500[a]	0.010
No	1115	95.1		
Region of living				
Black Sea	249	21.2		
Central Anatolia	245	20.9		
Eastern Anatolia	200	17.1		
Mediterranean	194	16.5	18.799[b]	0.005
Marmara	161	13.7		
Southeastern Anatolia	67	5.7		
Aegean	57	4.9		
COVID-19 diagnosis before				
No	1032	88	73750.000[a]	0.520
Yes	141	12		
Quarantine status				
No	798	68	153515.000[a]	0.472
Yes	375	32		
Physical activity time				
<30 minutes	665	56.7		
30 minutes	229	19.5		
30-60 minutes	145	12.4	80.833[b]	0.000
60 minutes	33	2.8		
> 60 minutes	101	8.6		
New dietary habit				
No	1075	91.6		
Healthy dietary	71	6.1		
rich in protein	12	1	40.000[b]	0.068
Intermittent dietary	12	1		
Mediterranean	3	0.3		
Mobile application for nutrition				
No	932	79.5	97515.000[a]	0.002
Yes	241	20.5		
Using a pedometer				
No	721	61.5	122381.000[a]	0.000
Yes	452	38.5		

[a]Mann-Whitney U test, [b]Kruskall-Wallis test

Table 2. Lifestyle changes during COVID-19 pandemic by demographic factors (n = 1173).

		Gender			Age Group (Year)			Educational Level		
Variables	**All *n* =1173**	**Female *n* =891**	**Male *n* =282**	***p* Value**	**13-18 *n* =405**	**19-25 *n* =768**	***p***	**High School *n* =420**	**University *n* =753**	***p***
Meals per day, n (%)										
Increased	422 (36)	327 (36.7)	95 (33.7)		165 (40.7)	257 (33.5)		164 (39)	258 (34.3)	
Same as before	521 (44)	362 (40.6)	28 (9.9)	0.000	178 (44)	343 (44.7)	0.008	183 (43.6)	338(44.9)	0.176
Decreased	230 (19.6)	202 (22.7)	159 (56.4)		62 (15.3)	168 (21.9)		73 (17.4)	157 (20.8)	
Water drinking, n (%)										
Increased	586 (50)	455 (51.1)	131 (46.5)		222 (54.8)	364 (47.4)		237 (56.4)	349 (46.3)	
Same as before	444 (37.9)	313 (35.1)	131 (46.5)	0.000	146 (36)	298 (38.8)	0.015	151 (36)	293 (38.9)	0.000
Decreased	143 (12.2)	123 (13.8)	20 (7.1)		37 (9.1)	106 (13.8)		32 (7.6)	111 (14.7)	
Sweet, n (%)										
Increased	488 (41.6)	387 (43.4)	101 (35.8)		178 (44)	310 (40.4)		180 (42.9)	308 (40.9)	
Same as before	416 (35.5)	279 (31.3)	137 (48.6)	0.000	152 (37.5)	264 (34.4)	0.033	162 (38.6)	254 (33.7)	0.024
Decreased	143 (12.2)	225 (25.3)	44 (15.6)		75 (18.5)	194 (25.3)		78 (18.6)	191 (25.4)	
Calorie Intake, n (%)										
Increased	526 (44.8)	391(43.9)	135 (47.9)		208 (51.4)	318 (41.4)		207 (49.3)	319 (42.4)	
Same as before	377 (32.1)	235 (26.4)	112 (39.7)	0.000	126 (31.1)	251 (32.7)	0.001	133 (31.7)	244 (32.4)	0.25
Decreased	270(23)	265 (29.7)	35 (12.4)		71 (17.5)	199 (25.9)		80 (19)	190 (25.2)	
Healthy Snack, n (%)										
Increased	541 (46.1)	414 (46.5)	127 (45)		191 (47.2)	350 (45.6)		202 (48.1)	339 (45)	
Same as before	532 (45.4)	386 (43.3)	146 (51.8)	0.000	179 (44.2)	353 (46)	0.845	182 (43.3)	350 (46.5)	0.564
Decreased	100 (8.5)	91 (10.2)	9 (3.2)		35 (8.6)	65 (8.5)		36 (8.6)	64 (8.5)	
Harmful snack, n (%)										
Increased	479 (40.8)	380 (42.6)	99 (35.1)		181 (44.7)	298 (38.8)		183 (43.6)	296 (39.3)	
Same as before	400 (34.1)	265 (29.7)	135 (47.9)	0.000	139 (34.3)	261(34)		89 (21.2)	252 (33.5)	0.068
Decreased	294 (25.1)	246 (27.6)	48 (17)		85 (21)	209 (27.2)	0.042	148 (35.2)	205 (27.2)	
Fast food, n (%)										
Increased	226 (19.3)	380 (42.6)	99 (35.1)		83 (20.5)	143 (18.6)		83 (19.8)	143 (19)	
Same as before	429 (36.6)	265 (29.7)	135 (47.9)	0.000	160 (39.5)	269 (35)	0.113	167 (39.8)	262 (34.8)	0.141
Decreased	518 (44.2)	246 (27.6)	48 (17)		162 (40)	356 (46.4)		170 (40.5)	348 (46.2)	
Screen time, n (%)										
Increased	601 (51.2)	459 (51.5)	142 (50.4)		212 (52.3)	389 (50.7)		214 (51)	387 (51.4)	
Same as before	375 (32)	270 (30.3)	105 (37.2)	0.023	126 (31.1)	249 (32.4)	0.855	132 (31.4)	243 (32.3)	0.846
Decreased	197 (16.8)	162 (18.2)	35 (12.4)		67 (16.5)	130 (16.9)		74 (17.6)	123 (16.3)	

Physical activity in home, n (%)										
Increased	366 (31.2)	290 (32.5)	76 (27)		124 (30.6)	242 (31.5)		136 (32.4)	230 (30.5)	
Same as before	581 (49.5)	407 (45.7)	174 (61.7)	0.000	198 (48.9)	383 (49.9)	0.740	200 (47.6)	381 (50.6)	0.620
Decreased	226 (19.3)	194 (21.8)	32 (11.3)		83 (20.5)	143 (18.6)		84 (20)	142 (18.9)	

Changes in Anthropometric Measurements Before and During COVID-19

Table 3 presents the changes in anthropometric measurements of the adolescents and young adults before and during the COVID-19 (***Table 3***). According to results, participant's height, weight, and BMI mean score (1,66±0,08; 63.86±13.17; 23.01±3.87) during the COVID-19 wre increased when we compare these mean scores given for the period before the pandemic (1.65±0,08; 61.31±13.22; 22.23±3.77) ($Z = -14.20$; $Z = -14.43$; $Z = -12.00$, $p < 0.05$).

Table 3. Comparison of the mean scores' anthropometric measurements before and during COVID-19

	Pre-COVID-19		During COVID-19		
	M±SD	**Min-Max**	**M±SD**	**Min-Max**	
Height	1.65±0,08	1.42-1.92	1,66±0,08	1.42-1.93	Z=-14,206 p < 0.05
Weight	61.31±13.22	40-130	63.86±13.17	40-127.5	Z=-14,439 p < 0.05
BMI	22.23±3.77	14.17-42.76	23.01±3.87	14.69-42.76	Z=-12,009 p < 0.05

We assessed the association between BMI, leisure screen time, screen time, physical activity duration, and dietary changes in COVID-19 pandemic with the Nutrition Exercise Behaviours Scale (NEBS) (***Table 4***). BMI, leisure screen time, and screen time during the pandemic were associated with NEBS ($p < 0.001$). A strong association was determined between physical activity duration and using pedometer during the pandemic and NEBS scores ($F = 61.602$, $p < 0.001$; $F = 55.579$, $p < 0.001$).

Table 4. Association of the BMI, leisure screen time, screen time, physical activity duration and dietary changes and NEBS during COVID-19, using multivariate general linear model

	B	**SE**	***β***	***t***	***p***	**95% CI**	**F**	***p***	**Partial η2**
BMI during pandemic	-0.561	0.152	-0.107	-3.695	0.00	-0.859, -0.263	13.653	<0.001	0.011
Leisure screen time (h)	-1.140	0.221	-0.166	-5.156	0.00	-1.574, -0.706	38.043	<0.001	0.049
Screen time (h)	-0.635	0.169	-0.121	-3.752	0.00	-0.967, -0.303	48.442	<0.001	0.039
Physical activity duration (h)	2.782	0.354	0.224	7.849	0.00	2.086, 3.477	61.602	<0.001	0.050
Dietary changes[a]	3.089	1.158	0.078	2.666	0.00	0.816, 5.361	7.110	<0.001	0.004
Mobile application for nutrition	-5.096	1.457	-0.102	-3.498	0.00	-7.955, -2.238	12.234	<0.001	0.010
Using a pedometer	-8.857	1.188	-0.213	-7.455	0.00	-11.187, -6.526	55.579	<0.001	0.045

B: Beta coefficient; SE: Standard error; β: Standardized beta coefficient; 95% CI: 95% confidence interval
[a]: 1 = No, 2 = Yes

It was determined that there was a negative and significant relationship between BMI and psychological/addictive eating behavior and unhealthy eating behavior (r=-0.185 p=0.00; r=-0.060, p=0.038). A significant relationship was found between screen time and all subscales of the NEBS scale. A moderate positive correlation was found between healthy eating exercise behavior and meal order, and between unhealthy eating exercise behavior and psychological/ addictive eating behavior (r=0.526 p=0.00; r=0.634 p=0.00) (***Table 5***).

Table 5. The relationship between NEBS's subscales each other, BMI, screen time and education levels

	Psychological/addictive eating behavior	Meal scheme	Healthy nutrition-exercise behavior	Unhealthy nutrition-exercise behavior
BMI	-0.185 p=0.00**	-0.007 p=0.798	0.019 p=0.524	-0.060* p=0.038
Educational level	-0.032 p=0.279	0.048 p=0.097	0.052 0.074	-0.112 p=0.00**
Screen time	-0.109 p=0.00**	-0.112 p=0.00**	-0.150 p=0.00**	-0.100 p=0.00**
Healthy nutrition-exercise behavior	-0.117 p=0.00**	0.526 p=0.00**		
Unhealthy nutrition-exercise behavior	0.634 p=0.00**	0.026 p=0.366		
Meal scheme	-0.106 p=0.00**			

Discussion

The COVID-19 pandemic has affected the whole world in a short time. In this regard, several measures against coronavirus have been also taken by Turkey, such as working from home, and closing many institutions (universities, shops, restaurants, etc.). Staying at home for a long time due to the pandemic in Turkey caused physical inactivity, changes in eating habits and lifestyle. Therefore, this study assessed lifestyle changes and nutrition exercise behaviors in adolescent and young adults by an online survey during the COVID-19.

Our study showed that pandemic and confinement resulted in lifestyle changes, weight gain, and increased BMI level. Participants also reported an increase in calorie intake and consumption of sugar, unhealthy snacking, and water. Also, dietary habits moved away from healthy nutrition and got closer to “unhealthy” dietary versions. The increased snacking among women while in-home isolation may reflect the social impact of the pandemic and confinement.[16] In our study, it was determined that there is an increase in the consumption of sugar, fast food nutrition, and harmful snacks in females. At the same time, it was found that screen time increased and calorie intake was higher in women. It is known that there is a relationship between the time spent in front of the screen and nutrition. It is also known that eating behavior is affected by stress and anxiety. During the pandemic, there was a notable rising in phone calls to mental health organizations, primarily by females aged 19-25.[17] Females appear to be more likely to “stress-eat” and consume harmful snacks.[18,19] In our study, the significant increase in lifestyle changes in female aged 19-25 is similar to the literature.

Most of the participants in the survey reported that they did 30 minutes or less of physical exercises during pandemic restriction. This was mostly seen among men in this study, and they were more likely to be inactive at the same time than women. The findings of this study overlap with those of other studies showing that the current COVID-19 pandemic is having a dramatic impact on lifestyle behaviors globally, including a decreased interest in physical activity in general.[6,20,21] In a recent study, it was determined that physical activity was negatively affected at all levels and sedentary time was increased by 28% during the COVID-19 home confinement.6 In addition, in a recent study conducted in Turkey, the result that physical activity decreased by 69.5% during the pandemic period compared to before shows parallelism with our study.[22] In the present study, the ratio of participants who spent more than five hours per day on screens was by 77.8%. In our study, we also evaluated the time spent on the screen for entertainment and time except outside of work / homework / lessons as "leisure screen time". In our study, the average leisure screen time was determined as four and a half hours. Also, it was determined that there was a negative relationship between screen time and unhealthy eating exercise behavior. Several epidemiological studies have shown that two

hours of screen-based entertainment per day is associated with a 48% increased risk of all-cause mortality, and four hours per day is associated with an approximately 125% increased risk of cardiovascular disease events.[23,24] This result also implies that encouraging physical activity and healthy nutrition in adolescents and young adults may be an effective way to decrease screen time.

Healthy eating and physical activity require a regular meal scheme. Therefore, an active life psychologically makes the person feel healthy and be more careful in their meal preferences. In the present study, a moderate positive relationship was found between healthy eating and exercise behavior and meal scheme, while a negative relationship was found with psychological eating behavior. In the study conducted by Kartal et al. a moderate relationship was found between healthy eating and meal patterns, and between unhealthy eating exercise behavior and psychological eating behavior in the adolescent population.[25] In the COVID-19 pandemic, school closures, and curfews have resulted in sedentary life in adolescents and young adults, affecting psychology and changing nutrition and exercise behaviors.

Strengths and Limitations of the Study

The strength of the research is that it is the first study on lifestyle changes in adolescents and young adults during the pandemic. We used an online questionnaire, a convenient research tool that allowed us to collect data from different regions of Turkey. Due to the increase in the use of social networks in special processes such as the pandemic, we decided to use an online form.

The present study has some general limitations regarding the use of self-reported questionnaires and the cross-sectional study design. The data and analyses were made with a cross-sectional study design. Thus, it can be difficult to make temporal and causal relations between variables.

Conclusions

The results of the study showed how the COVID-19 pandemic changed the nutritional trends and lifestyle changes of adolescents and young adults from every region of Turkey. Young adults exhibited a higher sweet, unhealthy snack and fast-food consumption during the COVID-19 confinement. Also, the association between gender, age, screen time, variables with nutrition exercise behaviors during COVID-19 was put forth. In future studies, large-scale research that can analyze eating habits and lifestyle changes can be conducted to promote the healthy program adoption among adolescents and young adults, especially after this isolation period. Identifying the dietary behaviors of current adolescents and young adults during COVID-19 confinement will help public health officials reshape future policies regarding nutrition and lifestyle recommendations as new pandemics and quarantines arrive.

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Ethical Approval

All the researchers participating in the study signed the Helsinki Declaration. Ethical approvals were obtained from Bolu Abant İzzet Baysal University Ethical Committee of (15.11.2020 /protocol number: 2020/257).

Author contributions

Çiğdem Sarı Öztürk: Conceptualization, Methodology, Software, Validation, Investigation, Formal analysis, Data Curation, Writing-Original Draft, Supervision, Project administration, Writing-Review & Editing.

Çiğdem Ceylan: Software, Investigation, Formal analysis, Data Curation, Supervision, Writing-Review & Editing.

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