

# The effect of Covid-19 pandemic on healthy lifestyle behaviors and quality of life in Turkey

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## Abstract

**Introduction.** It is very important to understand the potential for change in healthy lifestyle behaviors and quality of life of individuals before and during the COVID-19 pandemic. **Aim of Study.** The aim of this study was to examine changes in healthy lifestyle behaviors and quality of life in individuals living in Turkey before and during the COVID-19 pandemic from March to May 2020. **Material and Methods.** A total of 921 individuals were selected by convenience and snowball sampling in Turkey. The data of the study were collected using an online questionnaire. The questionnaire consisted of four parts, the first part comprised questions determining socio-demographic characteristics, the second part was the International Physical Activity Questionnaire (IPAQ) to determine the level of physical activity, the third part was a self-administered questionnaire which was developed by Sakamaki et al. (2005) as an eating habits questionnaire [23], while the last part was the Visual Analog Scale to measure the quality of life of respondents. **Results.** The average age of the participants was  $29.38 \pm 9.16$  years, 57.2% were women, 61.6% worked and 53% fell in the professional jobs category. It was found that the participants' body mass index (BMI) increased 50.3% during the curfew period in the beginning of the COVID-19 pandemic ( $p < 0.05$ ). According to IPAQ results, physical activity levels of the participants decreased statistically during the pandemic ( $p < 0.5$ ). Considering the variables evaluating changes in participants' dietary habits, there was a statistically significant increase in regular breakfast preparation and snack consumption during the day ( $p < 0.05$ ). Almost half of the participants (46%) reported that their quality of life had deteriorated during the pandemic. **Conclusions.** Consequently, when trying to prevent the COVID-19 infection or any epidemic in the short term, it is recommended not to neglect its effects on the quality of life and healthy lifestyle behaviors of the general population in the long term.

**KEYWORDS:** quality of life, physical activity, nutrition, healthy behaviors, COVID-19.

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## Introduction

A pandemic is an epidemic of an infectious disease that has spread across a large region, for instance several continents or worldwide, affecting a substantial number of people and leading to multiple deaths [3]. The World Health Organization (WHO) on March 11, 2020 has declared the coronavirus (COVID-19) outbreak a global pandemic [31]. As of March 18, 2021, WHO statistics showed that 2,664,386 people had died from COVID-19, while over 120,383,919 infections had been confirmed [30]. The common goal of all countries since the early days of 2020 has been to take action to contain the infection until the vaccine is found and it is available for everyone globally.

As a result of the physical and social distance measures applied since March 11, 2020, when the first case was reported in Turkey, millions of people were confined to live within a limited space. In addition, the fact that leisure and entertainment venues (restaurants, cafes,

shopping malls, pools, sports halls) were closed until June 1, 2020 imposed changes in people's lifestyle habits. Presumably, this dramatic change in lifestyle through immobility (hospitalization and bed rest), physical inactivity due to curfew, is seen as another adverse limitation for the health and quality of life both for infected people and the general population [28].

Prolonged staying home may lead to increased sedentary behaviors such as sitting, lying down, playing video games, watching television, using mobile devices and decreased regular physical activity, resulting in lower energy expenditure and consequently increased risk and potential deterioration of chronic health conditions [1]. It is estimated that because of the social distance measures, the eating (dietary) habits of individuals who spend most of their time at home have been changed significantly.

Healthy lifestyle is described as health-promoting behaviors, not smoking, good nutritional practices and adequate physical activity [12]. During the COVID-19 pandemic individuals' responsibility to support the immune system has been stated as choosing a healthy lifestyle, eating a diet rich in fruits and vegetables, exercising in their spare time, trying to maintain a healthy body weight and sleeping for sufficient time [16]. In addition to the above, avoidance of smoking and alcohol and minimization of stress are recommended [15]. Although social distancing reduces the risk of COVID-19 infection [4], it is estimated that isolation, quarantine and staying home for a long time together with the "pandemic fear" [17] create a negative burden on mental health [5], increase sedentary behaviors [14], decrease physical activity [2, 14, 20] all constitute a risk factor for chronic diseases and negatively affect the quality of life as a whole.

Quality of life is a broadly understood concept that is intricately influenced by an individual's physical health, psychological condition, personal beliefs, social relationships and relationships with remarkable characteristics of their environment. The WHO points out that 60% of the quality of life of individuals is provided by their healthy lifestyle behaviours [29]. While the fight against COVID-19 continues in many countries worldwide the encroachment of animal habitats by humans and the resumption of rapid intercontinental transportation increase the belief that we will face new pandemics in the near future [10]. As a result it suggests that physical and social distance measures will become permanent in our lives.

Initiatives to ensure that individuals practice healthy lifestyle behaviors despite these measures will strengthen

their immune systems and fight COVID-19, as well as reduce serious threats of inactivity, thereby supporting the overall quality of life for the general public. For this reason, it is very important to understand the potential for change to promote healthy lifestyle behaviors such as physical activity, adequate nutrition, non-smoking, limitation of alcohol consumption, good sleep and quality of life in individuals before and during the COVID-19 pandemic. The main assumption of the study was that people's healthy lifestyle habits and therefore their quality of life had changed negatively. In this regard, the aim of this study was to investigate changes in healthy lifestyle behaviors and quality of life in individuals living in Turkey before and during the first wave of the COVID-19 pandemic.

## Material and Methods

### *Study participants*

The study was conducted with individuals aged 18-64 years living in Turkey. In the national level studies regarding the representation of the country's population it is stated that a sample size of 1000 people provides statistically significant evaluations with a  $\pm 3\%$  standard error [13]. In the study convenience sampling (researchers reach out on their social networks) and snowball sampling methods (by asking the participants to share the survey with their own social networks) were used to reach the target sample within a short period of time. The data of the study were collected between 11 May and 25 May (15 days) 2020. In the study 921 participants completed the survey ( $\pm 3.23\%$  standard error). Ethical approval for the study was obtained from the Şırnak University Ethics Committee on 27.05.2020, number 74546226-020/.

### *Data collection tools*

The data were collected via an online survey. Access to the survey forms was provided by personally sharing the QR code and posting the survey on various social media platforms. It takes 10-15 minutes to complete the survey.

The survey questionnaire form consists of three parts. The first part comprises questions concerning demographic and socio-economic information (age, gender, marital status, education, employment status and economic status) and health status of individuals (self-rated health, presence of chronic disease, height and weight for BMI). The second part of the survey questionnaire consists of five indicators considering the "Healthy People 2020" [8] goals in order to assess healthy lifestyle behaviors

of the participants. These indicators include physical activity, healthy diet, smoking, alcohol consumption and a consistent sleep pattern. The International Physical Activity Questionnaires (IPAQ) Short Form was used to establish the participants' physical activity levels. This survey was developed by Craig et al. [7] to determine physical activity levels of the participants between the ages of 15-65. The Turkish validity and reliability study of the questionnaire was conducted by Ozturk [19]. The level of physical activity was classified as physically inactive (<600 MET-min/week), low physical activity (600-3000 MET-min/week) and sufficient/adequate physical activity health promoting (>3000 MET-min/week) [7]. Dietary, smoking and alcohol habits of the participants were assessed using an 11-question survey form previously applied in several studies [6, 23], which does not require adaptation according to region. In this form dietary habits, namely breakfast habits, consumption of snacks, consumption of vegetables and fruit as well as consumption of fried dishes were examined together. Sleep habits of the participants were determined by asking the question „On average, how many hours do you sleep on a normal day”.

The third part of the survey assessed the participants' quality of life using the Visual Analog Scale (“On the following scale below, we ask you to rate your quality of life on a scale of 0 to 10”) [24]. Because it is impossible to conduct a pre-pandemic survey, the second and third parts of the survey were answered twice with subjective estimation of the state before and during the pandemic measures.

#### Data analysis

Statistical analysis of the data was conducted using descriptive statistics and hypothesis tests in the SPSS 22.0 IBM, USA package program. The suitability of quantitative variables to normal distribution was tested with the Kolmogorov-Smirnov test. To statistically test the difference in healthy lifestyle behaviors and quality of life before and during the pandemic the Dependent Sample t-test was applied for quantitative variables and McNemar's test for categorical variables. The statistical significance level in the analyses was accepted as  $p < 0.05$ .

#### Results

The distribution of 921 people participating in the study according to their socio-demographic characteristics is shown in Table 1. The age of participants ranged from 18 to 64 years at the mean of  $29.38 \pm 9.16$  years and 60.5% of the participants were in the age group of 18-29 years. A total of 57.2% of the participants were women, and

68.4% of the participants were single. Socio-economic status indicators of the participants showed that 91.2% of them have higher education, 61.6% are employed, 53% are in the category of professional jobs and 28.7% rate their economic status as good. While 106 people (11.5%) who participated in the study reported having a chronic disease, 59.3% of the participants rated their general health as good. During the COVID-19 pandemic period, BMI was found to increase in 50.3% of the participants.

**Table 1.** The distribution of participants according to selected characteristics

	Frequency (n)	Percentage (%)
Gender		
women	527	57.2
men	394	42.8
Age		
18-29	557	60.5
30-49	331	35.9
50-64	33	3.6
Level of education		
high school or below	81	8.8
bachelor degree	840	91.2
Marital status		
single	630	68.4
married	291	31.6
Profession		
qualified	488	53.0
don't require qualification	103	11.2
not working	330	35.8
Employment status		
yes	567	61.6
no	354	38.4
Economic situation		
poor	657	71.3
good	264	28.7
Chronic disease		
yes	106	11.5
no	815	88.5

Self-rated health		
good	546	59.3
poor	375	40.7
Change in BMI*		
stable	194	21.1
increased	463	50.3
decreased	264	28.7
Change in quality of life <sup>a</sup>		
stable	385	41.8
increased	111	12.1
decreased	424	46.0

<sup>a</sup> BMI values before and during the pandemic were calculated based on the participants' statements of height, pre-pandemic weight and weight during the pandemic. According to the difference between the two values, the change in BMI was calculated. Change in quality of life was calculated in the same way.

Table 2 shows changes in quantitative variables (BMI, sleep – hours, sedentary time – hours, IPAQ-MET value) before and during the pandemic, while Table 3 shows changes in qualitative variables.

As can be seen in Table 2, the BMI of the participants showed a statistically significant increase of approximately 1% during the pandemic. When evaluated together with the change in BMI categories in Table 1 and Table 3, it

**Table 2.** Quantitative lifestyle changes before and during the COVID-19 pandemic

	Pre-Pandemic	During Pandemic	t	p
	Mean ± SD	Mean ± SD		
BMI	23.26 ± 4.00	23.47 ± 4.01	-2.038	0.000*
Sleep (hours)	7.33 ± 1.13	8.61 ± 2.10	-18.288	0.000*
Sedentary time (hours)	3.64 ± 4.41	8.44 ± 4.61	-14.697	0.000*
IPAQ-MET	3.122 ± 3.652	1.897 ± 3.119	9.657	0.000*

\* p < 0.05

is clear that the BMI for a majority of the participants increased during the pandemic and more participants moved to the above normal weight category. Secondly, it was found that participants' average sleep and sedentary time increased statistically significantly during the pandemic. When examining the MET-minute/week scores used to analyze the participants' IPAQ data, it was found that the participants' MET-minute/week scores decreased statistically significantly on average by 39% during the pandemic.

Table 3 shows that the participants' BMI increased statistically significantly during the pandemic and more participants moved into to the above normal BMI category (p < 0.05). Considering the variables evaluating changes in the participants' dietary habits we found that

**Table 3.** Qualitative lifestyle changes before and during the COVID-19 pandemic

	Pre-Pandemic		During Pandemic		p
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	
BMI					
underweight (<18.5)	97	10.5	83	9.0	0.003*
normal (18.5-24.9)	557	60.5	553	60.0	
overweight (≥25.0)	267	29.0	285	30.9	
Eating regularly					
regular	588	63.8	575	62.4	0.443
irregular	333	36.2	346	37.6	
Healthy breakfast					
daily	513	55.7	585	63.5	0.041*
four-day week	163	17.7	123	13.4	
two-day week	121	13.1	60	6.5	
rarely	124	13.5	153	16.6	

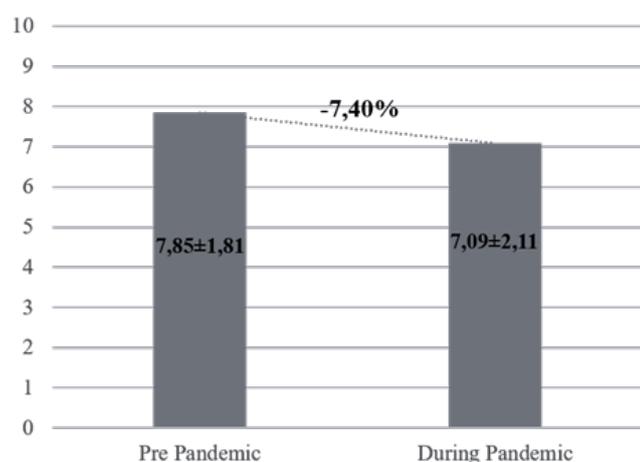
Snack					
daily	300	32.6	303	32.9	
four-day week	171	18.6	223	24.2	0.002*
two-day week	173	18.8	162	17.6	
rarely	277	30.1	233	25.3	
Green, red and yellow vegetables					
daily	262	28.4	262	28.4	0.560
four-day week	365	39.6	358	38.9	
two-day week	209	22.7	204	22.1	
rarely	85	9.2	97	10.5	
Fruit					
daily	280	30.4	315	34.2	0.466
four-day week	277	30.1	240	26.1	
two-day week	197	21.4	183	19.9	
rarely	167	18.1	183	19.9	
Frying					
daily	36	3.9	38	4.1	0.776
four-day week	158	17.2	174	18.9	
two-day week	363	39.4	320	34.7	
rarely	364	39.5	389	42.2	
Alcohol					
never	427	46.4	536	58.2	0.000*
2-3 times a week	131	14.2	99	10.7	
rarely	363	39.4	286	31.1	
Smoking					
yes	340	36.9	290	31.5	0.000*
no	581	63.1	631	68.5	
Physical activity					
inactive	263	28.6	543	59	0.000*
low	280	30.4	217	23.6	
adequate	378	41	161	17.5	

\* p < 0.05

there is a statistically significant increase in regular breakfast preparation and snack consumption during the day ( $p < 0.05$ ). A statistically significant decrease was recorded in alcohol consumption and smoking habits of the participants during the pandemic ( $p < 0.05$ ). It may be concluded that most participants preferred to abstain

from alcohol and smoking. When examining changes in the physical activity level of the participants it was found that physical activity decreased statistically significantly during the pandemic ( $p < 0.5$ ).

Almost a half of the participants (46%) reported that their quality of life deteriorated during the pandemic, as



**Figure 1.** The quality of life of participants before and during the COVID-19 pandemic

seen in Table 1. It was determined that the average scores of the Visual Analog Scale, which shows the quality of life ratings of the participants, decreased statistically significantly during the pandemic with an average of 7.40% ( $t = 12.040$ ;  $p < 0.05$ ), as seen in Figure 1.

## Discussion

The aim of this study was to determine the effect of the COVID-19 pandemic on healthy lifestyle behaviors and quality of life among individuals living in Turkey. The most important results of the study can be summarized as follows. Firstly, the physical activity levels of individuals decreased during the pandemic. Secondly, it can be stated that there was a positive change in breakfast habits and a negative change in snack consumption. Finally, the quality of life of individuals deteriorated.

When physical activity indicators of people participating in the study were examined, a statistically significant decrease was found in the proportion of those who were sufficiently physically active before the pandemic and 59% of them were not active during this period. In parallel with the decrease in physical activity, it was observed that the average daily sedentary time increased by 131%. Similarly, many previous studies confirmed that physical activity decreased while sedentary time increased during the pandemic period in Canada [25], in the USA [14] and in multinational studies [2, 20]. During the pandemic period the closure of sports halls and swimming pools and the imposition of a long weekend curfew in Turkey prevented physical activities outdoors. When changes in the participants' lifestyle are examined in terms of healthy nutrition a positive change in breakfast habits and a negative change in snack consumption may be observed. Similarly, studies of Di Renzo et al. on

3,533 people in Italy [9] and Sidor and Rzymiski on 1,097 people in Poland [25] showed that eating habits during the COVID-19 period changed. In investigations conducted by Ruiz-Roso et al. in Spain [22] and Górnicka et al. in Poland [11] snack consumption was also found to increase. However, insufficient consumption of vegetables and fruits by the participants was also valid for the pre-pandemic period and supports the findings of the Turkish Nutrition and Health Survey [26]. During the pandemic the transition of many workplaces to working from home or to short-term work may have improved the regular breakfast habit, but it was observed that staying at home for a long time increases the consumption of snacks due to stress.

It was found that 50% of the participants had a statistically significant increase in BMI. The negative effects of the pandemic period on BMI were also shown in studies by Ruiz-Roso et al. [22] and Sidor and Rzymiski [25]. As a result of the negative effect on physical activity and diet it was found that the participants were not able to maintain their ideal body weight during the pandemic period.

When examining the average daily sleep times of individuals as an indicator of their healthy lifestyle behaviors, it was found that individuals who participated in the study had the ideal amount of sleep time before and during the pandemic when their sleep time increased on average by 17%. Although sleep time was considered as a variable in some studies focusing on lifestyle changes with the COVID 19 pandemic, it indicates parallel results with the findings of the study [11]. On the other hand, there are almost no studies in Turkey that take the "sleep" variable into account as a healthy lifestyle habit. In addition to the proven negative effect of smoking on health, experts have stated that it is a serious risk factor for the patient's condition to deteriorate and be severe in the case of COVID-19 [27]. It was accepted as an important change that 50 people who participated in the study stopped smoking during this period. Similarly, it was found that alcohol use by the participants decreased statistically significantly during that period. This could be explained with the lockdown or home confinement and limited access to public spaces [2, 20].

Finally, it was found that people's quality of life as measured by the visual analog scale decreased statistically significantly by about 7.40% with the pandemic. In comprehensive studies by Ammar et al. [2] and Repišti et al. [21], it was found that the quality of life deteriorated during the pandemic period.

It would be correct to evaluate the results of the research with some limitations. Since the convenience sampling method was used in this study, generalizing the results to

the whole of Turkey may lead to incorrect conclusions. The questionnaire was designed as an online survey and the sample population in the study was limited to people who had an online access. The accuracy of the data collected in the study is based on the assumed correct and sincere responses of the participants in the questionnaires.

### Conclusions

To our knowledge, this study is the first in Turkey on changes in healthy lifestyle behaviors and quality of life as short-term consequences of the COVID-19 pandemic period. The main findings of the study reveal the development of interventions in two important aspects. First, the measures and precautions taken during the pandemic period should be implemented with supportive interventions that prevent the spread of COVID-19 while mitigating negative health outcomes in the general population. One of the most important lessons to be learned during the COVID-19 pandemic period is to encourage people to stay at home, while instructing them to stay active at home and eat healthy. Secondly, even if it is not possible to continue some habits due to legal restrictions during the pandemic period (e.g. daily swimming is no longer possible, because swimming pools are closed), a healthy lifestyle will strengthen the immune system while fighting COVID-19. Additionally, it should not be ignored that it supports efforts to continue a normal lifestyle in various ways despite the limitations, which should be encouraged in all circumstances. For example, involvement in physical activity while maintaining social distancing [18] needs to be encouraged. Considering the insufficiency of physical activity and the prevalence of obesity in Turkey, it is not an unwarranted concern that COVID-19 may cause multiple negative health consequences in the long term.

### Conflict of Interests

The author declares there was no conflict of interest.

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