

Obesity pandemic triggered by the COVID-19 pandemic: experience from Turkey

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Introduction The COVID-19 pandemic has significantly changed the lifestyle of people throughout the world.¹ In Turkey, the first case was diagnosed on March 11, 2020. After that, the Ministry of Health has taken several vital precautions to prevent the spread of the pandemic. Among these precautions were: curfew for older people and children, working from home, flexible working hours, temporary closure of public places, schools switching to the online mode of education, and curfew on weekends.

Minor body weight changes may become permanent in short periods, causing significant weight gain over time.² Concerns regarding weight gain were raised during the pandemic.³ This study aimed to evaluate the effects of pandemic period-related lifestyle changes on body weight.

Methods We included patients who presented at the Department of Endocrinology at the Faculty of Medicine of Aydin Adnan Menderes University between July and September 2020 and had their body weight measured within 3 months before April 2020. The weights were measured and recorded at baseline and after 3 months. Patients were also asked to fill out questionnaires inquiring about their lifestyles before and during the pandemic.

Statistical analysis R software, version 4.1.0 (R Foundation for Statistical Computing, Vienna, Austria) was used for statistical analyses. The normality of continuous variables was assessed using the Kolmogorov–Smirnov test. Because not all continuous variables had normal distribution, paired samples and independent samples were compared by the Wilcoxon test and the Mann–Whitney test, respectively. The McNemar test was used to compare the working status variable with pre and post measurements. The Kendall τ -b test was used to compare body mass index (BMI) and exercise variables measurements before and

during the pandemic. The relationship between independent qualitative variables was determined using the χ^2 test. Descriptive statistics were shown as medians with interquartile ranges (IQRs) and frequencies. A *P* value of less than 0.05 was considered statistically significant. Approval was obtained from the Ethics Committee of the Faculty of Medicine of Aydin Adnan Menderes University.

Results and discussion A total of 752 patients (74.2% were women) were included in the study. The median (IQR) age of the patients was 48 (37–59) years. The median (IQR) time since the last control examination before the pandemic was 5 (4–5) months. Of the patients, 28.9% had type 2 diabetes mellitus (T2DM), 40.69% had hypertension, 26.1% had thyroid disease, 20.1% had hypothyroidism, 8.1% had depression, and 3.19% had coronary artery disease. Of the presented patients, 68% were on long-term drug therapies (9.84% were on a psychiatric drug). While 3.7% were using weight-loss drugs (orlistat, liraglutide, exenatide) prepandemic, 1.3% continued to use them during the pandemic. Only a single patient had COVID-19. About 17.7% of patients were smokers, and 8.4% consumed alcohol. About 28.6% of patients were actively working, 50% were homemakers, 14.2% were retired, 3.7% were students, and 3.5% were unemployed. During the pandemic, 11.8% of patients were actively working, 5.7% were working from home, and 2.6% had flexible working hours, whereas 16.9% were unemployed. About 13% of patients experienced continuous curfew during the pandemic. About 73.14% of patients had children who participated in online education at home. About 64.76% of patients stated that they prepared high glycemic index foods (bread, flour, and sugary foods). About 18% stated that they stayed home more due to working from home, had flexible working hours, or because they were unemployed, and snacked at home during this period,

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TABLE 1 Comparison of the variables before and during the COVID-19 pandemic

Variable		Before the pandemic	During the pandemic	P value
BMI ^a , kg/m ²	<18.5 (underweight)	1.5	1.2	<0.001
	18.5–24.99 (normal weight)	29.1	24.9	
	25–29.99 (overweight)	33.9	31.8	
	30–39.99 (obese)	31.5	37	
	40–49.99 (morbidly obese)	4	5.2	
	≥25	69.42	73.94	
Actively working		28.6	11.8	<0.001
Exercise ^b	Status No	54	75.9	<0.001
	Regularly	35.4	16.6	
	Irregularly	10.6	7.4	

Data are shown as percentage of patients.

a Kendall τ -b coefficient = 0.868

b Kendall τ -b coefficient = 0.579

Abbreviations: BMI, body mass index

whereas 41.5% stated that their food intake increased during the pandemic. The consumption of high glycemic index foods was determined to increase in 50.6% of the patients with increased food intake. About 54% of patients did not exercise before the pandemic while 35.4% exercised regularly and 10.6% irregularly. Among the people who exercised, 83.3% did so by walking and 8.1% attended a gym. It was determined that 75.9% did not exercise during the pandemic, and 16.6% exercised regularly and 7.4% irregularly. About 77.8% of the respondents who exercised during the pandemic did so by walking, while 15% exercised at home. All respondents who did not exercise during the pandemic expressed that they could not do so because they did not want to go out due to the curfew and fear of contagion. About 86.17% of patients expressed that they spent more time using social media than before the pandemic. The median (IQR) body weight was 75 (65–85) kg before and 78 (67–89) kg after the pandemic ($P < 0.001$). The median (IQR) prepandemic BMI was 27.7 (24.2–31.5) kg/m² and during the pandemic, 28.7 (24.8–32.7) kg/m² ($P < 0.001$). It was determined that patients gained a median (IQR) of 2 (0–5) kg (3.5%) weight and the median BMI increased by 0.7 (0–1.8) kg/m². Weight gain was observed in 59.2% of the patients. Among patients who had gained weight, the median (IQR) weight gain was 4 (2–7) kg (6.42%). The median (IQR) age of patients that gained weight was 46 (36–57) years and 53 (40–62) years in other patients ($P < 0.001$). The median (IQR) BMI of patients who gained weight was 28.1 (24.5–31.7) kg/m² before the pandemic and 30 (26.2–33.7) kg/m² during the pandemic ($P < 0.001$). Analysis of postpandemic BMIs revealed that the percentage of obese patients

increased from 31.5% to 37%, while the percentage of morbidly obese patients increased from 4% to 5.2% (Kendall τ -b coefficient = 0.868; $P < 0.001$). Differences between the variables before and during the pandemic are shown in **TABLE 1**. During the pandemic, 36.4% of underweight patients, 53.4% of patients with normal weight, 60.4% of overweight patients, 62.9% of obese patients, and 70% of morbidly obese patients gained weight. The ratio of patients gaining weight during this period increased with increasing BMI. During the pandemic, 55.8% of patients with T2DM and 60.6% of those without diabetes gained weight ($P = 0.222$). Among the depressed patients, 63.9% gained weight. Loss of weight was observed in 4.2% of patients during this period (1.73% voluntarily). While the median (IQR) prepandemic HbA_{1c} level of diabetic patients ($n = 193$) was 6.7% (6.2%–7.85%), it was found to be 7.3% (6.6%–8.6%) during the pandemic ($P < 0.001$). Weight gain was observed in 65% of nonexercisers and 28% of regular exercisers during the pandemic ($P < 0.001$). Weight gain was observed in 86% of patients who were actively working before the pandemic, working online from home during the pandemic, 70% of those working with flexible hours, and 59.1% of those unemployed during the pandemic. During that period, the daily consumption of cigarettes increased in 15.8% of the smokers, while alcohol consumption increased in 8.9% of the alcohol users. Weight gain was observed in 82.1% of patients with increased cigarette consumption and in 87.5% of those with increased alcohol consumption ($P < 0.001$, $P = 0.001$, respectively). Weight gain was observed in 37.8% of the patients whose food intake did not increase from that in the prepandemic period, whereas 90.4% of patients with increased food intake during the pandemic showed weight gain ($P < 0.001$).

It has been highlighted that the COVID-19 pandemic causes prevalent and rapid weight gain through multiple mechanisms such as behavioral, psychosocial, and environmental factors. The authors have referred to this phenomenon as “co-vibesity”.⁴ Since more time was spent home, increase in snack consumption and irregular nutrition became prevalent.⁵ With the transition of schools to the online model of education and the curfew for children, children continuously stayed at home in Turkey. During this period, families prepared carbohydrate-heavy snacks and ate more often than usual at home.⁶ In a study conducted in Turkey, a significant increase in the daily consumption of 3 or more snacks was observed, as was the consumption frequency of chocolate, sugary food, and junk food during the pandemic.⁷ We observed weight gain in 90.4% of the patients who had increased food intake.

Long durations of isolation were associated with elevated stress, triggering alcohol and cigarette consumption.³ In this study, we observed weight gain in 82.1% of those who consumed more cigarettes during the pandemic and 87.5%

of those with increased alcohol consumption. In an online study, the frequency of smoking increased in over 45% of the smokers, and a 14.6% increase in alcohol consumption was determined during this period. This suggests that elevated stress and anxiety also caused changes in the eating habits of these people.⁸ Previous studies have reported various symptoms of anxiety and depression in obese patients with no previous psychiatric diagnosis.⁹ In one study, 43% of the participants reported overeating, and approximately 52% stated that they consumed a greater quantity of snacks. Overweight and obese individuals tended to gain weight more commonly.⁸ In this study, we determined that the percentage of patients with weight gain increased with an increase in BMI. In another study, patients with T2DM were assessed during the pandemic, and apart from weight gain, statistically insignificant increases in their glycemic parameters were determined.¹⁰ Our study detected an increase in the HbA_{1c} levels of diabetic patients during the pandemic. Weight gain in patients with T2DM has been known to worsen glycemic control.¹⁰ Another study determined that 34.4% had increased appetite, and 48.6% had a perception of weight gain during this period. Besides, 40.3% of the participants thought that their body weight increased slightly, whereas 8.3% thought they encountered a considerable weight gain.¹¹ An online study reported that approximately 30% of the participants encountered a weight gain of 3 kg.⁸

We determined a median weight gain of 4 kg (6.42%) in 59.2% of 752 patients during a median period of 5 months, and the percentage of patients with BMI of more than 30 kg/m² increased by 18.73%.

During a pandemic, patients should focus on diet and lifestyle behavior. Patients are advised to reduce the consumption of processed food, sweets, and sweetened beverages, and avoid excessive alcohol intake. It is vital to do regular physical activity adjusted to pandemic restrictions. Especially patients with a BMI greater than 24.99 kg/m² should focus on these recommendations.¹² As the time spent at home increases, patients should increase their daily walking steps and home exercises (such as Pilates, aerobic exercise, dance), limit screen time, avoid a sedentary lifestyle, focus on proper nutrition, and monitor weight gain.

In conclusion, we determined that most of the patients gained weight, and the ratio of obese patients increased during this period. The development of an obesity pandemic parallel to the COVID-19 pandemic seems probable. We suggest that it is necessary to fight obesity while fighting COVID-19.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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