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Lifestyle and eating behaviors during the COVID-19 pandemic: a cross-sectional study in Turkey

Cengiz Caner^{1*}, Aygul Can² and Muhammed Yüceer^{3*}

*Correspondence:

Cengiz Caner
ccaner@comu.edu.tr
Muhammed Yüceer
myuceer@comu.edu.tr

¹Department of Food Engineering,
Canakkale Onsekiz Mart University,
Canakkale 017020, Türkiye

²Gastronomy and Culinary Arts,
Gaziantep Islam Science and
Technology University,
Gaziantep 027010, Turkey

³Department of Food Processing,
Canakkale Onsekiz Mart University,
Canakkale 017020, Türkiye

Abstract

The COVID-19 pandemic significantly influenced individuals' lifestyles, eating behaviours, and food ordering purchasing practices, potentially altering overall dietary patterns. This study aimed to determine lifestyle and eating behavior among Turkish adults during COVID-19. A survey was conducted in 2023 in Çanakkale using a Google Forms questionnaire to collect data from 365 Turkish individuals on sociodemographic factors, lifestyle, food purchasing habits, and dietary routines during the pandemic. Kruskal–Wallis tests were used to determine compare continuous variables across multiple groups. Findings revealed that 52.1% of participants experienced weight gain, 68.7% reported sleep disturbances, and exercise frequency declined during the pandemic. Conversely, smoking and alcohol consumption habits remained largely unchanged in about 60% of individuals. Employment status was found to significantly influence most lifestyle variables ($p < 0.05$). Regarding food shopping, 70.7% preferred chain supermarkets, while 46% engaged in online shopping, primarily for meat (47.7%) and snacks (27.4%). Online purchasing was significantly associated with age, education level, and employment ($p < 0.05$). A strong preference for homemade meals (94.8%) was also reported. In terms of dietary patterns, 58.1% maintained water intake, while 57.1% increased tea/coffee consumption. Daily meal frequency remained unchanged in 57.9%, yet notable increases were seen in the consumption of dairy/eggs (39.6%), fruits (38.4%), bread/pasta (34.1%), and meat (22.6%). About half reported greater intake of nutrient-dense foods, desserts, and snacks. This study reveals how COVID-19 affected dietary behaviors in Türkiye, highlighting the need for targeted interventions and offering valuable insights to guide healthier lifestyle promotion and future health emergency planning.

Keywords COVID-19, Pandemic, Eating behaviors, Lifestyle behaviors, Online survey

1 Introduction

COVID-19 is a multi-systemic infectious respiratory disease caused by the SARS-CoV-2 virus, first identified in Wuhan, China, in December 2019. It rapidly spread across the globe, leading to profound public health, economic, and social disruptions. On March



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11, 2020, the World Health Organization officially declared COVID-19 a global pandemic. Although initially regarded as a public health issue, the pandemic quickly revealed its far-reaching effects on daily life worldwide, significantly altering individual routines and lifestyles [1, 2].

In the absence of a specific treatment for COVID-19, countries adopted various strategies to manage the crisis. These approaches, varying in severity, included social distancing in public and issuing stay-at-home orders. As part of these strict lockdown measures, schools, businesses, and services such as sports facilities, restaurants, and cafes have been closed. This has necessitated a shift to online education for students and remote work for many employees. However, the closure of these services has had significant economic consequences, including business shutdowns, widespread unemployment, and financial hardship [3, 4].

Lockdown conditions have impacted people's working hours at home, their regular physical activity routines due to limited access to outdoor spaces and gyms, their sleeping patterns. Additionally, some individuals developed unhealthy habits, such as increased smoking or alcohol consumption [5]. The pandemic not only strained health-care systems but also negatively impacted education, employment, income, social interactions, and mental health [6]. These changes also influenced food-related behaviours. Limited access to fresh and processed foods led many people to stockpile items like flour, oil, sugar, milk, and eggs [7]. Consumers increasingly turned to online grocery shopping as in-store visits declined. While dining out or ordering takeaway was common before the pandemic, lockdowns encouraged home cooking as a way to better manage both health and financial concerns. As a result, individuals began prioritizing foods that were convenient, affordable, and health-promoting [8].

Despite temporary control of the virus, the emergence of second, third, and even fourth waves prolonged restrictions, reinforcing a cycle of lockdowns and quarantine. This recurring instability heightened psychological stress and further disrupted daily life. Elevated levels of anxiety, depression, and stress affected dietary choices and consumption frequencies. Many individuals reported increased snacking and a preference for comfort foods such as sweets, chocolate, and sugary beverages in response to negative emotions [9, 10]. Ensuring a balanced and nutritious diet remains essential not only for physical health and immune function but also for mental well-being across all life stages [11–13].

Studies from various countries have documented significant shifts in lifestyle and dietary patterns during the pandemic. These include changes in eating behaviors in Italy [5, 7], Malaysia [14, 15], the United Arab Emirates (UAE) [16], the Turkey [17, 18], the United Kingdom (UK) [9], and China [19]; weight changes in the UAE [16]; physical activity levels in Italy [7], the UAE [16], the UK [9], in Australia [20], in Cyprus [21], in Malaysia [22, 23], sleeping patterns in the UAE [16] and the UK [9]; smoking habits in Italy [7]; and stress and snacking behaviors in Jordan [24]. In Türkiye, Demir [25] has studied the nutrition, health behavior changes, and eating habits of adults (aged ≥ 20) during the COVID-19. The results showed that smoking, alcohol consumption and physical activity rates decreased, while sleep duration increased significantly. In addition, body mass index and nocturnal eating rates increased, as did overeating during the pandemic. The consumption of sweets and tea/coffee also increased during this period.

Collectively, these findings highlight the pandemic's widespread impact on global lifestyle and dietary behaviors. Therefore, the aim of the present study is to examine the effects of the COVID-19 pandemic on lifestyle, food shopping behavior, and changes in food and beverage preferences and frequency among Turkish adults. Additionally, it seeks to explore the relationship between sociodemographic variables and behavioral changes during lockdown. Understanding these dynamics is crucial for developing effective public health strategies and planning future interventions that promote healthy behaviors during health emergencies. This study's findings can guide research and interventions, particularly focusing on diet and daily habits, to support communities during emergencies and prevent the consolidation of unhealthy behaviors.

2 Methods

2.1 Study design and data collection

A cross-sectional survey study was conducted in Türkiye, involving participants who consented to complete an online questionnaire via the Google Forms platform during February – June, 2023. The study aimed to examine how the COVID-19 pandemic, particularly during the partial lockdown period, impacted the dietary habits and lifestyles of Turkish individuals before and during the pandemic.

The target population consisted of students, staff, and their families from the Engineering Department. The sample size was determined using the RaoSoft® online sample size calculator. Based on an estimated population of individuals, including students, staff, and their families from the Engineering Department at Çanakkale Onsekiz Mart University, and assuming a 50% response rate, the minimum required sample size was calculated to be 357 participants, with a 95% confidence level and a 5% margin of error. A total of 367 participants were purposefully selected to ensure representation across diverse demographic variables, including gender, age, educational background, employment status, and income level. This sampling strategy was employed to capture the heterogeneity of the population in Turkey affected by the COVID-19 pandemic, thereby enhancing the relevance and contextual validity of the findings.

The consumer questionnaire, originally structured and prepared in Turkish and consisting of 40 questions, was translated and provided in Appendix 1. The questionnaire was organized into four key sections. The first section gathered sociodemographic data, including gender, age, education, employment status, and income changes during the pandemic (Appendix 1, Questions 1–5). The second section explored lifestyle changes, addressing participants' experiences with COVID-19, changes in weight, exercise frequency, sleep patterns, and substance use such as alcohol and smoking (Appendix 1, Questions 6–15). The third section focused on dietary habits, meal choices, food orders, and shopping behaviors, including preferences for homemade meals, ready meals, frozen food, or takeaways (Appendix 1, Questions 16–21). The final section examined food consumption patterns, including the frequency of pasta, meat, fruit, vegetables, dessert, dairy products, and snacks, along with participants' self-perception of their diet's healthiness (Appendix 1, Questions 22–40). Each question was designed to capture relevant behavioral changes and health habits influenced by the COVID-19 pandemic, and responses were mainly structured using multiple-choice options to facilitate analysis.

2.2 Statistical analysis

Once the questionnaire was filled out, the responses were downloaded into a Microsoft Excel® sheet. A total of 367 participants filled out the online survey, and after validating the data, 365 participants were considered for analysis in the study. Categorical variables are shown as numbers with percentages in parentheses (%). To analyze the relationships between sociodemographic factors and COVID-19 pandemic-related effects on eating habits and lifestyle, Kruskal–Wallis tests were used to compare continuous variables across multiple groups (p value < 0.05). All statistical analyses were conducted using IBM SPSS Statistics version 21 (IBM, Chicago, IL, USA).

3 Results and discussion

3.1 Sociodemographic factors

The sociodemographic factors of the participants are outlined in Table 1, including a total of 365 individuals. Among them, 266 were female (72.9%), 96 were male (26.3%), and 3 chose not to mention their gender preference (0.8%). Our results displays the age groups of the participants, indicating a somewhat different age distribution for both males & females. While participants in the age group of 18–30 constituted 49.7% of the population, the age group of 31–50 represented 36.5%. In terms of educational status, the majority of participants (62.4%) were undergraduate students, with high school students also contributing to 23.2% of the participants. Regarding employment status, the participants exhibited diverse profiles: 28.1% were categorized as students, 44.1% as employed, 7.4% as self-employed, 10.7% as unemployed, and 9.6% as retired. Additionally, 57.1% of the participants indicated that their income status remained unchanged during the COVID-19, while 37.1% mentioned a decrease in income during this period. Similar trends obtained in previous study conducted by Tan, Tan and Tan [26]. The study involved 1045 young adults in Malaysia during the COVID-19 lockdown to assess

Table 1 Sociodemographic factors of participants according to gender

Demographic characteristics		Total	Female (n:266)	Male (N:96)	Not to mention (n: 3)
		Count, (%)	Count, (%)	Count, (%)	Count, (%)
Age groups (Years) (Missing:1)	< 18	5 (1.4%)	1 (0.4%)	4.2 (4%)	0 (0%)
	18–30	181 (49.7%)	125 (47.2%)	57.3 (55%)	1 (33.3%)
	31–50	133 (36.5%)	104 (39.2%)	29.2 (28%)	1 (33.3%)
	51–65	41 (11.3%)	32 (12.1%)	8.3 (8%)	1 (33.3%)
	65+	4 (1.1%)	3 (1.1%)	1 (1%)	0 (0%)
Education status (Missing:1)	Elementary school	11 (3%)	9 (3.4%)	2.1 (2%)	0 (0%)
	Secondary school	11 (3%)	7 (2.6%)	4.3 (4%)	0 (0%)
	High School	84 (23.2%)	63 (23.8%)	21.3 (20%)	1 (33.3%)
	Undergraduate	226 (62.4%)	166 (62.6%)	61.7 (58%)	2 (66.7%)
	Postgraduate	30 (8.3%)	20 (7.5%)	10.6 (10%)	0 (0%)
Employment status (Missing:2)	Student	102 (28.1%)	68 (25.8%)	34.4 (33%)	1 (33.3%)
	Employed	160 (44.1%)	113 (42.8%)	47.9 (46%)	1 (33.3%)
	Unemployed	39 (10.7%)	37 (14%)	2.1 (2%)	0 (0%)
	Self-employed	27 (7.4%)	18 (6.8%)	9.4 (9%)	0 (0%)
	Retired	35 (9.6%)	28 (10.6%)	6.3 (6%)	1 (33.3%)
Income level (Missing:1)	Increased	21 (5.8%)	9 (3.4%)	12.5 (12%)	0 (0%)
	Decreased	135 (37.1%)	96 (36.2%)	39.6 (38%)	1 (33.3%)
	Not changed	208 (57.1%)	160 (60.4%)	47.9 (46%)	2 (66.7%)

body weight changes and dietary intake patterns. Nearly half (48.8%) of the respondents gained weight during the confinement, with an average increment of 4.06 ± 3.23 kg. 36.3% of young adults lost weight during the pandemic lockdown, with an average weight loss of 4.90 ± 4.38 kg. There was no significant difference in BMI before (22.78 ± 4.87 kg/m²) and during the pandemic (22.85 ± 4.70 kg/m²), with a noted increment in BMI by 0.31% throughout the confinement. In another study conducted by Tan, Tan and Tan [27], the weight gain results during the Movement Control Order (MCO) in Malaysia were analyzed using self-regulatory eating scores and weight trajectory predictors. In the study, 57.0% of young adults claimed they had put on weight during the MCO, with a significant weight increment of 1.28 ± 0.60 kg. Self-regulatory eating scores were significantly lower in those who perceived weight gain compared to other weight perceptions. Self-regulation in eating behavior was found to be a significant predictor for weight trajectory during the MCO, with higher scores associated with sustained weight and weight loss categories.

3.2 Lifestyle changes induced by pandemic

In this section, the frequency and percentage of lifestyle changes among participants during COVID-19 were presented in Table 2. Additionally, the relationship between sociodemographic factors and COVID-19-induced lifestyle; including changes in weight, exercise, sleep patterns, vitamin usage, smoking, and alcohol consumption, were explored (Table 3).

Regarding their health status, the majority of participants (81.4%) stated that they did not have COVID-19, 13.2% had COVID-19, and the remaining 5.5% were unsure whether they had it or not. The rate of body weight changes during the COVID-19 pandemic was examined. More than half of the participants (52.1%) highlights an “increased weight” during the COVID-19, while only 15.9% maintained the same weight (Table 2). The impact of various factors during lockdown, such as remote work, online education, self-isolation, managing income and stress, has been studied extensively and has shown significant effects on eating habits and weight changes [28]. Analyses revealed a significant relationship between weight change during lockdown and employment status ($p = 0.033$) (Table 3). Firstly, in Italy, which experienced the COVID-19 pandemic earlier and more severely compared to other European countries, research by Di Renzo, Gualtieri, Pivari, Soldati, Attina, Cinelli, Leggeri, Capareello, Barrea, Scerbo, Esposito and De Lorenzo [5] found that a considerable proportion of the population reported increased appetite (34.4%), correlating with observed weight gain (48.6%) in nearly half of the Italian populace during the COVID-19 [5]. Similarly, Scarmozzino and Visioli [29] reported 52.9% of Italians consuming more during lockdown, leading to weight gain (19.5%) in a substantial portion of the population [29]. In parallel, a cross-sectional online survey carried out among adult Poles revealed similar trends. Over 43.0% reported increased meal consumption, nearly 52% reported increased snacking, and around 30% reported weight gain, while over 18% experienced weight loss during restriction [30].

Most of the participants reported not exercise (41.2%) or exercising only 1–2 days a week (34.1%) before the COVID-19. Regarding changes of the lifestyle's during the COVID-19 restriction, a lower percentage of participants highlighted involved in exercise compared to before the COVID-19. Specifically, the rate of participants who exercised 1–2 days and 3–4 days decreased from 34.1% to 24.7% and from 20.3% to 9.4%,

Table 2 Frequency and percentage of lifestyle habits among participants during COVID-19 pandemic

Questions		Count	Count (%)
Have you had COVID-19?	Yes	48	13.2%
	No	297	81.4%
	Not sure	20	5.5%
How has your weight changed during the pandemic?	Increased	190	52.1%
	Decreased	58	15.9%
	Not changed	117	32.1%
How many days a week were you exercising before the pandemic?	0	150	41.2%
	1–2	124	34.1%
	3–4	74	20.3%
	5+	16	4.4%
How many days a week do you exercise during the pandemic?	0	222	61.5%
	1–2	89	24.7%
	3–4	34	9.4%
	5+	16	4.4%
How many hours of sleep do you get a day?	< 6	62	17.0%
	6–8	190	52.1%
	8–10	101	27.7%
	10+	12	3.3%
Has your sleep pattern changed during the pandemic?	Yes	250	68.7%
	No	114	31.3%
Did you start using vitamins etc. during the pandemic?	Yes	154	42.4%
	No	174	47.9%
	I was already using	35	9.6%
Did you start drinking alcohol or smoking during the pandemic?	Yes	37	10.3%
	No	321	89.7%
How has our alcohol use changed during the pandemic?	Increased	32	8.8%
	Decreased	36	9.9%
	Not changed	81	22.2%
	I do not drink	216	59.2%
How has your smoking changed during the pandemic?	Increased	81	22.4%
	Decreased	13	3.6%
	Not changed	59	16.3%
	I do not smoke	209	57.7%

respectively (Table 2). These lower percentage of physical activity may be related with feelings of social isolation [31, 32]. The government restrictions that limit community engagement in outdoor exercise and social activities such as going to the gym or shopping [9, 33]. Statistical analyses underlined that, although the frequency of exercise was significantly linked to gender ($p = 0.024$), age ($p = 0.001$), and employment status ($p = 0.002$) before the lockdown, during the lockdown, it was only significantly associated with age ($p < 0.001$) and employment status ($p = 0.033$) (Table 3). In line with our findings, the physical activity rate in Buenos Aires, Argentina, decreased from 70% before the COVID-19 pandemic to just 13% during the lockdown [33]. Similarly, an online survey conducted among approximately 860 children and adolescents (3–16 years old) in Spain revealed a significant reduction in weekly minutes of physical activity during the confinement [34]. Additionally, in Australia, there was a notable decrease, with around 30% fewer students achieving ‘sufficient’ levels of physical activity, defined as at least 150 min over at least five sessions, compared to the last two years [35]. However, some studies indicated a contrasting trend, suggesting that physical activity increased during the

Table 3 The associations between sociodemographic factors and COVID-19 pandemic-induced lifestyle changes

Questions	Gender (df:2)		Age groups (df:4)		Education status (df:4)		Employment status (df:4)		Income level (df:2)	
	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>
Have you had COVID-19?	4.309	0.116	4.703	0.319	2.890	0.576	5.923	0.205	3.694	0.158
How has your weight changed during the pandemic?	2.048	0.359	7.999	0.092	1.742	0.783	10.456	0.033	2.989	0.224
How many days a week were you exercising before the pandemic?	7.447	0.024	18.462	0.001	1.355	0.852	17.443	0.002	5.004	0.082
How many days a week do you exercise during the pandemic?	4.597	0.100	23.065	<0.001	2.469	0.650	18.992	0.001	0.943	0.624
How many hours of sleep do you get a day?	4.864	0.088	6.215	0.184	1.084	0.897	14.008	0.007	2.727	0.256
Has your sleep pattern changed during the pandemic?	4.164	0.125	9.839	0.043	2.232	0.693	22.512	<0.001	28.205	<0.001
Did you start using vitamins etc. during the pandemic?	10.294	0.006	5.422	0.247	6.103	0.192	27.261	<0.001	2.957	0.228
Did you start drinking alcohol or smoking during the pandemic?	1.784	0.410	4.722	0.317	6.055	0.195	4.256	0.373	0.296	0.862
How has our alcohol use changed during the pandemic?	23.263	<0.001	35.326	<0.001	12.288	0.015	22.310	<0.001	4.084	0.130
How has your smoking changed during the pandemic?	0.607	0.738	3.977	0.409	18.025	0.001	13.071	0.011	3.462	0.177

Chi-Square: χ^2 , the degrees of freedom: *df*, *p*-values: *p*^a Kruskal-Wallis Test-Statistical significance is expressed as *p* < 0.05 and significant *p*-values highlighted in bold

lockdown period, possibly as individuals sought to enhance mood, well-being, or maintain healthy routines at home. According to a global survey involving 16,137 individuals from 99 countries, while 23.7% reported a decrease, 31.9% highlighted an increase in exercise frequency during the COVID-19 [36]. Interestingly, our survey revealed that the proportion of individuals engaging in exercise 5 or more times per week remained consistent before and after the COVID-19. Conversely, in Italy, there was a significant rise in the number of individuals training five or more days a week, increasing from 6% to 16% [5].

A majority of participants (52.1%) get 6–8 h of sleep daily, while 27.7% sleep for 8–10 h. Furthermore, 68.7% of participants stated that their sleep patterns are influenced by the COVID-19 (Table 2). Statistical analyses underlined that, before lockdown, the frequency of sleep was significantly related only with employment status (*p* = 0.007).

However, during lockdown, it was significantly associated with age ($p = 0.043$), employment status ($p < 0.001$), and income ($p < 0.001$) (Table 3). Stress is known to impact sleep negatively, causing disruptions in sleep routines. In Italy, a study involving 2291 participants showed that 57.1% reported experiencing poor sleep quality due to the COVID-19 [37]. Similarly, a longitudinal study on 41 obese Italian children and adolescents in Verona found significant changes in sleep patterns and a notable increase in sleep duration during the lockdown [38]. Additionally, there was an observed increase in sleep duration among Italians aged ≥ 12 years due to the lockdown [5]. Conversely, in Spain, participants reported an improvement in sleep quality during the lockdown period [34].

During the COVID-19, 47.9% of the participants began taking vitamins into their routine during COVID-19 (Table 2). The intake of micronutrients is associated with immune responses, and a deficiency in these compounds can increase vulnerability to viral infections [39]. Analyses showed a significant related between vitamin use during the pandemic and both gender ($p = 0.006$) and employment status ($p < 0.001$) (Table 3). The 2021 study by Katz, Yue and Xue [40] examined patients with both vitamin D deficiency and COVID-19 between October 2015, and June 2020. The research highlighted a significant correlation between vitamin D deficiency and an increased risk of contracting COVID-19. Patients deficient in vitamin D were 4.6 times more likely to test positive for COVID-19 compared to those without the deficiency [40]. In addition, providing a significant dose of vitamin D₃ either before or during the previous stage of COVID-19 is related with milder cases of the virus among frail elderly individuals [41]. Only a small percentage of the participants (10.3%) started drinking alcohol or smoking during the COVID-19 pandemic. The majority of participants (59.2%) stated that they do not consume alcohol, while a similar majority (57.7%) reported that they do not engage in smoking. While there was an 8.8% increase in alcohol usage and a 9.9% decrease during the COVID-19, the smoking rate increased to 22.4% (Table 2). The duration of lockdown has adversely affected mental well-being, and the consumption of alcohol has been linked to unfavorable changes in mood [42]. Although we observed a low percentage of participants ($\sim 10\%$) starting alcohol consumption, and the overall alcohol consumption remained relatively stable without a remarkable increase or decrease. Statistical analysis from Table 3 indicates significant associations between gender ($p < 0.001$), age ($p < 0.001$), education status ($p = 0.015$), and employment status ($p < 0.001$) with alcohol consumption during lockdown. However, only education status ($p = 0.001$) and employment status ($p = 0.011$) were found to be significantly related with smoking during the COVID-19 pandemic. There are reports from around the world indicating changes in alcohol consumption during the COVID-19. Similarly [33], et al. carried out a comparative study on alcohol consumption before and during the isolation of the population in Buenos Aires, Argentina, and found that the consumption of alcohol remained similar before and during the isolation period [33, 43]. investigated alcohol usage-related behaviors among Indonesians during the lockdown. The study revealed a 23.8% increase in alcohol consumption for individuals under 40 years old, while those over 40 years old experienced a more substantial increase of 51.7%. Furthermore, the survey about eating behaviors and lifestyle changes of Italians and Spanish during the COVID-19 pandemic showed the decrease in drinking alcoholic beverages [5, 44]. Similar to our findings, while half of Indonesians perceived no change in cigarette consumption during the COVID-19, approximately 20% reported increased smoking due to the lockdown

Hanafi, Siste, Limawan, Sen, Christian, Murtani, Adrian, Siswidiani and Suwartono [43]. Among the Italian residence aged ≥ 12 years, 3.3% of smokers made the decision to quit smoking during the lockdown, possibly due to fears of increased risk of respiratory distress and mortality when experiencing COVID-19 symptoms such as fever, cough, and breathlessness [5, 45].

The COVID-19 pandemic led to significant lifestyle changes among participants, notably in weight gain (52.1%), reduced physical activity, and altered sleep patterns (68.7%). Exercise frequency declined, especially among certain age and employment groups, while vitamin usage increased (47.9%), particularly among women and the employed (Table 1). Most participants maintained stable smoking and alcohol habits, though slight increases were observed. These changes were significantly associated with sociodemographic factors such as age, gender, education, income, and employment status, reflecting broader global trends observed during lockdowns.

3.3 Changes in food order and meal choices induced by pandemic

The frequency and percentage of changes in meal choices and food orders among participants during lockdown are presented in Table 4.

Table 4 Frequency and percentage of meal choices and food orders among participants during COVID-19 pandemic

Questions		Count	Count (%)
Which food group did you consume the most during the pandemic?	Fruits/Vegetables/Legumes	125	34.4%
	Red-White meat/Milk/Egg	138	38.0%
	Cake/dessert (high sugar content)	38	10.5%
	Bread/Pasta/Rice	62	17.1%
	Missing	2	0.6%
Where do you prefer to do your food shopping?	Chain markets	258	70.7%
	Online	70	19.2%
	Others	13	3.6%
	Small retailers (grocery store, butcher, candy store, etc.)	146	40.0%
Have you ever shopped for food online?	Yes	161	44.1%
	No	204	55.9%
If you shopped for food online, which food groups did you prefer the most?	Fruits and vegetables	59	16.2%
	Dairy products	68	18.6%
	Meat products	174	47.7%
	Pasta/Rice/Bulgur/Flour/Olive Oil	84	23.0%
	Bakery products	24	6.6%
	Packaged snacks	100	27.4%
	Soft drinks	57	15.6%
	Never	197	54.0%
What was your preferred food choice during the pandemic?	Homemade	346	94.8%
	Ready meals	15	4.1%
	Frozen food	19	5.2%
	Take away	58	15.9%
	Restaurant	7	1.9%
	Others	6	1.6%
How has your takeaway order changed compared to before the pandemic?	Increased	64	17.6%
	Decreased	122	33.6%
	Not changed	177	48.8%

When the participants were asked, “Which food group did you consume the most during the COVID-19?” they highlighted consuming the Red-White meat/Milk/Egg group (38.0%) and the Fruits/Vegetables/Legumes group (34.4%) more than the Bread/Pasta/Rice group (17.1%) and the Cake/Dessert group (10.5%). According to responses, the majority of the participants purchased foods from chain markets (70.7%) and small retailers (40.0%) (Table 4). Similarly, the population in Italy purchased food at supermarkets (75.8%), grocery shops (26.0%), and farmers, organic, or local markets (14.8%). Finally, only 9.0% used online delivery during lockdown [5].

Online shopping was less common among our participants, with only 19.2% claiming to order groceries online. Although 55.9% of them had never done their food shopping online, a considerable number of participants (44.1%) changed their shopping habits and prioritized online shopping due to limited accessibility to in-store shopping because of COVID-19 (Table 4). When exploring the links between sociodemographic factors and online food shopping, significant correlations were observed with age ($p < 0.001$), education level ($p < 0.001$), and employment status ($p < 0.001$) (Table 6). When they shopped online, participants preferred these three food groups the most: meat products (47.7%), packaged snacks (27.4%), and Pasta/Rice/Bulgur/Flour/Olive Oil (23.0%). The attendees were also asked about their preferred food choices during the COVID-19. A total 94.8% favored homemade meals, while 15.9% preferred take-out, and 4.1% chose ready-made meals (Table 4). An online survey in Poland reported a 48.0% increase in preference for homemade food [46]. The increased preference for homemade food is likely related to the lockdown and limited accessibility to restaurants. This shift aligns with concerns about disease and hygiene, prompting individuals to prioritize healthier options to boost their immune systems and manage expenses. Analyses indicated a significant association between changes in take away ordering frequency and age ($p < 0.001$) as well as employment status ($p = 0.005$) (Table 6). This decrease in take away preference (33.6%) likely reflects this health and financial considerations.

During the COVID-19 lockdown (Table 4), participants mostly consumed meat, dairy, fruits, and vegetables. While chain markets were the primary shopping source, 44.1% shifted to online shopping. Homemade meals were highly preferred (94.8%), with reduced take-out consumption due to health and financial concerns.

3.4 Changes in beverage consumption induced by COVID-19 pandemic

The frequency and percentage of changes in beverage consumption during lockdown were presented in Table 5. Additionally, the associations between sociodemographic factors and changes in beverage consumption induced by COVID-19, were explored in Table 6.

Water and various beverages like soft drinks, coffee, and tea typically serve as the primary sources of hydration, contributing approximately 65–80% of total intake, alongside moisture-rich foods [47]. Our results indicate that 53.8% of participants underlined consuming less than eight cups of water daily, falling short of the recommended intake outlined by the European Food Safety Authority (2.0 L/day for men and 1.6 L/day for women) [48]. While a majority (58.1%) maintained their pre-pandemic water consumption levels, a considerable portion (34.2%) reported an increase during the COVID-19 (Table 5). Statistical analyses revealed a significant relation between age and daily water consumption during the COVID-19. Consistent with our findings, over half of the

Table 5 Frequency and percentage of beverage consumption and food preference among participants during the COVID-19 pandemic

Questions		Count	Count (%)
How many glasses of water do you drink a day?	1–4	87	23.9%
	4–7	109	29.9%
	7–10	93	25.5%
	> 10	75	20.6%
How has your daily water consumption changed during the pandemic?	Increased	125	34.2%
	Decreased	28	7.7%
	Not changed	212	58.1%
Which of the hot drinks do you prefer the most?	Tea	191	52.5%
	Herbal tea	17	4.7%
	Turkish coffee	86	23.6%
	Different coffees	69	19.0%
	Others	1	0.3%
How many cups of tea/coffee etc. do you drink per day?	0	5	1.4%
	1–3	164	44.9%
	3–5	115	31.5%
	5+	81	22.2%
How has your consumption of tea/coffee etc. changed during the pandemic?	Increased	208	57.1%
	Decreased	13	3.6%
	Not changed	143	39.3%
How many meals a day do you eat?	1–2	92	25.3%
	2–3	223	61.4%
	4–5	47	12.9%
	5+	1	0.3%
How has the number of meals changed during the pandemic?	Increased	103	28.4%
	Decreased	50	13.8%
	Not changed	210	57.9%
How many times a week do you consume bread/pasta?	0	27	7.6%
	1–3	282	79.4%
	4–5	40	11.3%
	5+	6	1.7%
How did your bread/pasta consumption change during the pandemic?	Increased	124	34.1%
	Decreased	44	12.1%
	Not changed	196	53.8%
How many times a week do you consume meat?	0	21	5.9%
	1–2	233	65.1%
	3–4	98	27.4%
	5+	6	1.7%
How has your meat consumption changed during the pandemic?	Increased	82	22.6%
	Decreased	35	9.6%
	Not changed	246	67.8%
How many times a week do you consume fruit and vegetables?	0	7	1.9%
	1–3	144	39.6%
	4–5	102	28.0%
	5–6	70	19.2%
	7+	41	11.3%
How did your fruit and vegetable consumption change during the pandemic?	Increased	139	38.4%
	Decreased	22	6.1%
	Not changed	201	55.5%

Table 5 (continued)

Questions		Count	Count (%)
How many times a week do you consume dessert?	0	15	4.2%
	1–2	156	43.5%
	3–4	123	34.3%
	5–6	45	12.5%
	7+	20	5.6%
How did your dessert consumption change during the pandemic?	Increased	183	50.6%
	Decreased	22	6.1%
	Not changed	157	43.4%
How has your consumption of milk / dairy products and eggs changed during the pandemic?	Increased	144	39.6%
	Decreased	9	2.5%
	Not changed	211	58.0%
During the pandemic, did your consumption of high nutritious foods such as nuts, tahini-bread, etc. increase?	Yes	215	59.6%
	No	146	40.4%
How did your snack food (chocolate, crackers, etc.) consumption change during the pandemic?	Increased	174	48.2%
	Decreased	40	11.1%
	Not changed	147	40.7%
Finally, do you think you eat a healthy diet?	Yes	188	51.8%
	No	175	48.2%

participants (60.7%) aged over 18 and living in Italy increased their water intake during the COVID-19 [49]. Hassen et al. reported that nearly half of participants (44.6%) in Qatar increased their water intake during the COVID-19, highlighting shifting beverage consumption patterns (Ben Hassen et al., 2020). Sahin et al. found that among young adults in Türkiye, 29% of total water intake came from drinking water, 49% from other liquid beverages, and 22% from foods [47].

In our survey, the majority (52.5%) favored tea, followed by Turkish coffee (23.6%) and other varieties of coffee (19%). Hot beverage preference showed significant associations with age ($p < 0.001$) and employment status ($p < 0.001$) (Table 6). A significant portion consumed 1–3 cups (44.9%) or 3–5 cups (31.5%) of tea/coffee daily, with a notable increase during the COVID-19 (57.1%). The regular intake of tea/coffee was significantly linked to age ($p < 0.001$) and employment status ($p < 0.001$). However, it was notably associated not just with age ($p = 0.007$) and employment status ($p = 0.012$), but also with income level ($p = 0.028$) during the pandemic (Table 6). A review of 472 articles, including 23 on beverages, identified 13 meeting with criteria across 6 databases. Castellana, De Nucci, De Pergola, Di Chito, Lisco, Triggiani, Sardone and Zupo [50] noted no clear pattern in coffee consumption during the COVID-19, with 7 of 13 studies showing an increase (53.8%). However, tea consumption notably rose (70% versus 30%). Additionally, Buhlmeier, Frolich, Ludwig, Knoll-Pientka, Schmidt, Focker and Libuda [10] observed a 37.1% increase in coffee-based drink intake among emotionally driven individuals in a study involving 580 German participants. In COVID-19 pandemic circumstances, this finding may suggest heightened tea consumption, possibly linked to increased stress and confusion due to the epidemic and the shift to remote work from home [50].

During the COVID-19 lockdown, 53.8% of participants consumed less than the recommended daily water intake, though 34.2% reported increased water consumption. Tea was the most preferred beverage (52.5%), followed by Turkish coffee (23.6%) (Table 5). Hot beverage intake rose during the pandemic, significantly associated with age,

Table 6 The associations between sociodemographic factors and changes in beverage consumption and food preference induced by COVID-19 pandemic

Questions	Gender (df:2)			Age groups (df:4)			Education status (df:4)			Employment status (df:4)			Income level (df:2)		
	X ²	p		X ²	p		X ²	p		X ²	p		X ²	p	
Have you ever shopped for food online?	1.921	0.383		34.044	<0.001		40.886	<0.001		24.147	<0.001		0.593	0.743	
How has your takeaway order changed compared to before the pandemic?	3.953	0.139		29.271	<0.001		8.736	0.068		14.760	0.005		0.798	0.671	
How many glasses of water do you drink a day?	1.557	0.459		5.878	0.208		1.610	0.807		3.299	0.509		4.300	0.117	
How has your daily water consumption changed during the pandemic?	1.339	0.512		11.860	0.018		4.281	0.369		4.716	0.318		1.763	0.414	
Which of the hot drinks do you prefer the most?	1.903	0.386		22.807	<0.001		0.811	0.937		34.751	<0.001		5.463	0.065	
How many cups of tea/coffee etc. do you drink per day?	5.175	0.075		23.338	<0.001		5.090	0.278		24.203	<0.001		5.671	0.059	
How has your consumption of tea/coffee etc. changed during the pandemic?	0.500	0.779		13.986	0.007		9.066	0.059		12.804	0.012		7.157	0.028	
How many meals a day do you eat?	1.582	0.453		3.686	0.450		15.184	0.004		8.043	0.090		0.191	0.909	
How has the number of meals changed during the pandemic?	2.762	0.251		11.855	0.018		7.242	0.124		4.346	0.361		7.207	0.027	
How many times a week do you consume bread/pasta?	8.900	0.012		9.272	0.055		3.196	0.526		11.067	0.026		1.063	0.588	
How did your bread/pasta consumption change during the pandemic?	2.570	0.277		26.918	<0.001		7.735	0.102		14.453	0.006		3.479	0.176	
How many times a week do you consume meat?	9.367	0.009		6.869	0.143		4.571	0.334		8.854	0.065		0.055	0.973	
How has your meat consumption changed during the pandemic?	0.068	0.967		2.742	0.602		1.471	0.832		3.708	0.447		11.985	0.002	
How many times a week do you consume fruit and vegetables?	2.350	0.309		10.540	0.032		2.096	0.718		19.002	0.001		1.841	0.398	
How did your fruit and vegetable consumption change during the pandemic?	0.182	0.913		7.155	0.128		6.087	0.193		3.282	0.512		0.334	0.846	
How many times a week do you consume dessert?	2.985	0.225		5.544	0.236		9.519	0.049		4.968	0.291		3.026	0.220	
How did your dessert consumption change during the pandemic?	3.141	0.208		8.054	0.090		7.386	0.117		3.671	0.452		5.922	0.052	
How has your consumption of milk / dairy products and eggs changed during the pandemic?	1.305	0.521		8.832	0.065		2.676	0.613		7.611	0.107		2.310	0.315	
During the pandemic, did your consumption of high nutritious foods such as nuts, tahini-bread, etc. increase?	1.148	0.563		0.655	0.957		3.407	0.492		5.296	0.258		1.325	0.516	
How did your snack food (chocolate, crackers, etc.) consumption change during the pandemic?	0.852	0.653		34.460	<0.001		14.357	0.006		23.244	<0.001		1.443	0.486	
Finally, do you think you eat a healthy diet?	2.939	0.230		24.935	<0.001		5.962	0.202		14.430	0.006		2.522	0.283	

Chi-Square: X², the degrees of freedom: df, p-values: p^a Kruskal-Wallis Test-Statistical significance is expressed as p < 0.05 and significant p-values highlighted in bold

employment, and income (Table 6). These shifts may reflect increased stress and lifestyle changes such as remote work.

3.5 Food preference changes induced by pandemic

The frequency and percentage of changes in food preference among participants during COVID-19 were presented in Table 5. Additionally, the associations between sociodemographic factors and changes in food preference induced by COVID-19, were explored in Table 6.

The participants were asked, “How many meals a day do you eat?” 61.2% of the participants responded that they eat 2–3 meals a day, while 25.3% preferred to eat 1–2 meals. While 57.9% of them reported that their number of meals did not change, a 28.4% increase in the number of meals was observed during the COVID-19 pandemic (Table 5). Based on statistical analysis, meal frequency showed a significant related with education level ($p = 0.004$). Moreover, variations in daily meal frequency were notably linked to age ($p = 0.018$) and income level ($p = 0.027$) during pandemic (Table 6). The rise in the number of meals per day may be attributed to factors such as online learning for students and the transition to home office conditions for employees. Prolonged periods spent at home and negative mood, which have been observed to escalate during lockdown, may contribute to an increased tendency to consume more food [51]. Similar shifts in eating behaviors were also noticed in Australia, Poland, and Italy during the COVID-19. In an Australian survey, 35.5% of participants noted an increase in habits of binge eating [52]. The eating rate among participants rose by 43.5% in Poland and by 34% in Italy [5, 30].

Among the participants, 79.4% consume bread or pasta 1–3 times per week. The majority (53.8%) indicated that their consumption of bread and pasta remained unchanged, while 34.1% reported an increase in their intake compared to before the pandemic (Table 5). During pandemic, the consumption of bread/pasta displayed significant associations with age ($p < 0.001$) and employment status ($p = 0.006$) (Table 6). A survey conducted in Spain found that the consumption of bread and pasta/rice rose by approximately 40% during the lockdown period. Only about 10% of respondents indicated a decrease in their consumption of these foods [53].

In our survey, 65.1% of respondents indicated that they consume meat products 1–2 times per week, and 27.4% reported consuming meat products 3–4 times per week. For 67.8% of participants, their meat consumption remained unchanged during the COVID-19 (Table 5). Meat consumption exhibited a significant relation with gender ($p = 0.009$), whereas changes in meat consumption during the lockdown were notably related with income level ($p = 0.02$) (Table 6). A survey in Poland found that 18.0% of participants eat meat products daily, while 28.5% consume them a few times per week [30]. Likewise, 71.4% of the Polish population and about 55% of the Spanish inhabitant highlighted no change in their meat consumption during the lockdown [46, 53]. Similar to the consumption of meat products, there was a 39.6% increase in the intake of egg and dairy products (especially milk), while 58.0% of participants maintained their usual consumption levels of these products. According to a report by Bracale and Vaccaro [54] between February 23rd and March 29th, sales of 30 different food categories in Italy showed that sales of UHT milk and hen eggs rose by 28.7% and 34.4%, respectively, compared to the same period last year [54].

When we looked at changes in fruit and vegetable consumption, 39.6% of participants reported eating fruits and vegetables 1, 2 and 3 times per week, while 28.0% eat them 3–4 times per week. Similar to meat consumption patterns, 55.5% of participants did not change their fruit and vegetable intake during the lockdown (Table 5). Based on the statistical analysis while the frequency of fruit/vegetable consumption showed significantly related with age ($p = 0.032$) and employment status ($p = 0.001$), none of the sociodemographic factors were significantly correlated with changes in fruit/vegetable consumption during the pandemic ($p > 0.05$) (Table 6). Sidor and Rzymiski [30] found that fruits and vegetables were consumed a few times a week during the lockdown [30]. An online survey in Spain revealed that 62.1% and 64.7% of participants experienced no change in fruit and vegetable consumption, respectively [46]. Moreover, 38.4% of participants increased their fruit and vegetable intake during the lockdown. Similarly, while the majority maintained their usual consumption levels, about 35% of the population in Spain reported an increase in fruit and vegetable consumption [53].

Compared to the consumption of milk meat, fruit and bread, the highest increases were seen in the consumption of highly nutritious foods (59.6%), desserts (50.6%) and snacks (48.2%) (Table 5). Regarding these food items, only the consumption of snacks showed significant changes during the pandemic, which were related to age, education status, and employment status. A survey by Romeo-Arroyo et al. indicated a about 50% increase in sweet consumption during the lockdown [53]. In Poland, snacking increased by 46.5% among underweight participants, 50.1% among those with a normal BMI, and 55.3% among overweight individuals [30]. Obese participants also reported increased consumption of sweets (50%) and snacks (33%). Finally, nearly half of the participants (51.8%) believe they eat healthily, whereas the other half consider their diet unhealthy.

During the COVID-19 pandemic (Tables 5 and 6), participants experienced notable shifts in food preferences and eating habits. While 57.9% maintained their meal frequency, 28.4% reported an increase, significantly influenced by education, age, and income. Bread/pasta and meat consumption mostly remained stable, though 34.1% increased bread/pasta intake and 39.6% increased egg and dairy consumption. Fruit and vegetable intake showed minor increases (38.4%) with limited sociodemographic impact. The most significant increases were observed in the consumption of nutrient-dense foods (59.6%), desserts (50.6%), and snacks (48.2%), with snack intake changes linked to age, education, and employment. Overall, only half of the participants perceived their diet as healthy.

The strengths of this study lie in its comprehensive examination of the effects of the COVID-19 pandemic on lifestyle, food shopping behaviors, and dietary preferences among Turkish residents. The research provides valuable insights into how sociodemographic factors, such as gender, age, employment status, and education, influence behavioral changes during a crisis. The study's broad scope, addressing changes in exercise routines, sleep patterns, food consumption, and beverage preferences, offers a holistic understanding of the pandemic's impact. The use of detailed demographic analysis strengthens the applicability of the findings across diverse population segments. Furthermore, the study's focus on both traditional and online shopping behaviors, as well as food consumption patterns, adds depth to understanding the shift in consumer habits. These strengths contribute to the relevance and robustness of the study's findings in assessing public health and lifestyle changes during a global crisis.

4 Study limitations

This study has several limitations. First, the data collected through the questionnaire were self-reported, which introduces the potential for bias, as participants may have altered their responses to conform to social desirability. Another limitation is the relatively small sample size. However, the target population—comprising students, staff, and their families from the Engineering Department—was chosen for their relevant understanding of dietary habits and the diverse perspectives offered by their distinct roles. These factors may enhance the generalizability of the findings. Despite this, generalizability is limited by the study's focus on a single department at Çanakkale Onsekiz Mart University. The purposive sampling method could have led to over- or under-representation of certain demographic groups. Additionally, the impact of the COVID-19 pandemic on this specific population may not reflect the experiences of broader or different populations. Therefore, the findings should be interpreted with caution when applied to other contexts or groups.

5 Conclusions

The findings from this study highlight significant lifestyle changes among participants during the COVID-19 pandemic, particularly in terms of weight gain, sleep disturbances, and decreased exercise frequency. While many individuals maintained their smoking and drinking habits, employment status played a crucial role in influencing various lifestyle choices. Shopping preferences shifted towards chain markets, with a notable percentage of participants embracing online shopping for specific food categories. The strong inclination for homemade food suggests a preference for healthier meal options despite the challenges posed by the pandemic. These findings underscore the dynamic effect of the pandemic on dietary habits and highlight the significance of understanding and adapting to changing food preferences during times of crisis.

Future research should focus on longitudinal studies to assess the long-term effects of the pandemic on lifestyle, particularly dietary behaviors, physical activity, and mental health. Investigating the role of technology, socioeconomic factors, and gender-specific differences would provide valuable insights. Additionally, studies on the psychological drivers of dietary changes, nutritional impacts, regional food habits, food security, and post-pandemic shifts could enhance strategies for improving public health outcomes.

Appendix 1

Eating habits and lifestyle changes during COVID-19 pandemic: a questionnaire.

1. What is your gender?
Female/Male.
2. What age range are you in?
< 18/18–30/31–50/51–65/65+.
3. What is your level of education?
Elementary school/Secondary school/High school/Undergraduate/Postgraduate.
4. What is your employment status?
Student/Employed/Unemployed/Self-employed/Retired.
5. Has your income level changed during the pandemic?
Increased/Decreased/Not changed.
6. Have you had COVID-19?

Yes/No/Not sure.

7. How has your weight changed during the pandemic?

Increased/Decreased/Not changed.

8. How many days a week were you exercising before the pandemic?

0/1–2/3–4/5+.

9. How many days a week do you exercise during the pandemic?

0/1–2/3–4/5+.

10. How many hours of sleep do you get a day?

<6/6–8/8–10/10+.

11. Has your sleep pattern changed during the pandemic?

Yes/No.

12. Did you start using vitamins etc. during the pandemic?

Yes/No/I was already using.

13. Did you start drinking alcohol or smoking during the pandemic?

Yes/No.

14. How has our alcohol use changed during the pandemic?

Increased/Decreased/Not changed/I do not drink.

15. How has your smoking changed during the pandemic?

Increased/Decreased/Not changed/I do not drink.

16. Which food group do you consume the most during the pandemic?

Fruits-Vegetables-Legumes/Red-White meat-Milk-Egg/Cake-dessert (high sugar content)/Bread-Pasta-Rice.

17. Where do you prefer to do your food shopping?

Chain markets/Online/Others/Small retailers (grocery store, butcher, candy store, etc.)

18. Have you ever shopped for food online?

Yes/No.

19. If you shopped for food online, which food groups did you prefer the most?

Fruits and vegetables/Dairy products/Meat products/Pasta-Rice-Bulgur-Flour-Olive Oil/Bakery products/Packaged snacks/Soft drinks/Never.

20. What was your preferred food choice during the pandemic?

Homemade/Ready meals/Frozen food/Take away/Restaurant/Others.

21. How has your takeaway order changed compared to before the pandemic?

Increased/Decreased/Not changed.

22. How many glasses of water do you drink a day?

1–4/4–7/7–10/>10.

23. How has your daily water consumption changed during the pandemic?

Increased/Decreased/Not changed.

24. Which of the hot drinks do you prefer the most?

Tea/Herbal tea/Turkish coffee/Different coffees/Others.

25. How many cups of tea/coffee etc. do you drink per day?

0/1–3/3–5/5+.

26. How has your consumption of tea/coffee etc. changed during the pandemic?

Increased/Decreased/Not changed.

27. How many meals a day do you eat?

1–2/2–3/4–5/5+.

28. How has the number of meals changed during the pandemic?

Increased/Decreased/Not changed.

29. How many times a week do you consume pasta/pasta?

0/1–3/4–5/5+.

30. How did your bread/pasta/pasta consumption change during the pandemic?

Increased/Decreased/Not changed.

31. How many times a week do you consume meat?

0/1–2/3–4/5+.

32. How has your meat consumption changed during the pandemic?

Increased/Decreased/Not changed.

33. How many times a week do you consume fruit and vegetables?

0/1–3/4–5/5–6/7+.

34. How did your fruit and vegetable consumption change during the pandemic?

Increased/Decreased/Not changed.

35. How many times a week do you consume dessert?

0/1–2/3–4/5–6/7+.

36. How did your dessert consumption change during the pandemic?

Increased/Decreased/Not changed.

37. How has your consumption of milk / dairy products and eggs changed during the pandemic?

Increased/Decreased/Not changed.

38. During the pandemic, did your consumption of high nutritious foods such as nuts, tahini-bread, etc. increase?

Yes/No.

39. How did your snack food (chocolate, crackers, etc.) consumption change during the pandemic?

Increased/Decreased/Not changed.

40. Finally, do you think you eat a healthy diet?

Yes/No.

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AUTHOR DECLARATIONWe wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome. We confirm that the manuscript has been read and approved by named author and that there is no other persons who satisfied the criteria for authorship but are not listed. We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property. We further confirm that any aspect of the work covered in this manuscript that has involved either experimental animals or human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript. We understand that the Corresponding Author is the sole contact for the Editorial process (including Editorial Manager and direct communications with the office). He/she is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs. We confirm that we have provided a current, correct email address which is accessible by the Corresponding Author and which has been configured to accept email from myuceer@comu.edu.tr Signed by all authors as follows: Declaration of interests ☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. ☒ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: The primary purpose of our research is no medical research. The goal of the study can never take precedence over the rights and interests of individual research subjects.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

The signing of the Informed Consent Form (ICF) in this survey was replaced by verbal informed consent, at the time of telephone contact with the interviewees. The study was conducted according to all the ethical precepts recommended by Declaration of Helsinki, which regulates standards that promote and ensure respect for all human subjects and protect their rights. The research purpose and objectives were explained in clear, simple words, granting the participant the right to voluntary informed consent and the freedom to withdraw at any time without any deprivation. The collected data will not be used for any other purposes, nor does it contain any personal information.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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