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ORIGINAL RESEARCH

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The effect of COVID-19 pandemic on lifestyle-related behaviours in Turkey: A web-based cross-sectional study

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Abstract

Background: The COVID-19 pandemic and restrictions imposed to eradicate it have affected healthy lifestyle-related behaviours.

Aim: The aim of this study was to determine the effect of COVID-19 on lifestyle-related behaviours.

Methods: This cross-sectional web-based survey research was performed with a convenience sample of 1020 adults residing in Turkey. Data were collected with self-report data collection tools on 8–28 April 2021: a sociodemographic characteristics form and the impact of COVID-19 on lifestyle-related behaviours questionnaire.

Results: Eating behaviours, physical activity and sleep patterns of the participants were negatively affected during COVID-19 pandemic ($p < 0.001$). More than half of the participants experienced weight gain during the pandemic. Also, stress levels and smoking increased ($p < 0.01$). The participants reported having changes in their lifestyles most frequently due to the fear of COVID-19 infection, stress, decreased motivation, closure of the facilities for social and sports activities and increased food prices. Predictors of lifestyle-related behaviours were found to be education ($\beta = .189$), income ($\beta = -.101$), residing in a village ($\beta = .113$) and the presence of a chronic disease ($\beta = .075$) ($p < 0.001$).

Conclusions: During the pandemic, COVID-19-related restrictions should be applied whilst taking account of both social distancing measures and maintenance of healthy lifestyle-related behaviours. Nurses should offer counselling for maintenance of healthy lifestyle-related behaviours.

KEYWORDS
COVID-19, eating behaviour, lifestyle-related behaviours, nursing, physical activity

Summary statement

What is already known about this topic?

- Studies performed at the beginning and during the course of COVID-19 pandemic in different countries have shown that lifestyle-related behaviours are negatively affected.
- Few studies have used a valid and reliable tool to determine the effect of COVID-19 on lifestyle-related behaviours.

- The effect of COVID-19 on lifestyle-related behaviours has not been examined from a nursing perspective.

What this paper adds?

- In the present study, which was performed at a time when night curfews and weekend shutdowns were imposed in Turkey, lifestyles of the participants were found to be negatively affected.
- More than half of the participants gained weight and had increased stress and smoking and a decreased sleep quality.
- The negative effect on lifestyle-related behaviours was more severe in participants with low education and income levels, living in a village and suffering from a chronic disease.

The implications of this paper:

- Restrictions introduced during the pandemic should both take account of social distancing measures and allow healthy lifestyle-related behaviours.
- Nurses playing a role in first line health care services should offer education and counselling for maintenance of healthy lifestyle-related behaviours by utilizing information and communication technology (e.g., video calls).

1 | INTRODUCTION

The World Health Organization (WHO) declared COVID-19 outbreak to be a pandemic (WHO, 2020a). Subsequently, several precautions were taken and some restrictions on the society were imposed to prevent the spread of COVID-19 (Bruinen de Bruin et al., 2020; Nussbaumer-Streit et al., 2020). To bring the pandemic under control in Turkey, some restrictions such as working from home, closures of facilities for eating and drinking, recreations and social activities, night curfews and weekend shutdowns/stay at home orders were imposed (The Turkish Ministry of the Interior). Restrictions can be either strict or loosened depending on the number of COVID-19 cases. The virus has ongoing effects in the second year of the pandemic (Bakaloudi et al., 2021).

While these cautionary measures were necessary to lessen the burden of COVID-19 on the health system and decrease the number of fatalities associated with the disease, the same cautionary measures have also affected the daily life (Alothman et al., 2021). Several studies performed in different countries at the early phase of the pandemic revealed that cautionary measures affected lifestyle-related behaviours like nutrition, physical activity, social relationships, sleep, stress and smoking (Arora & Grey, 2020; Cheikh Ismail et al., 2020; Chopra, Ranjan, Singh, et al., 2020; di Renzo et al., 2020; Husain & Ashkanani, 2020; Stockwell et al., 2021; Znazen et al., 2021). Effects of the measures on dietary habits were found to vary from country to country. Some studies performed during COVID-19 pandemic showed that food consumption and eating pattern (food preferences, food avoidance, uncontrollable eating and number of snacks and meals) were unhealthier (Alfawaz et al., 2021; Ammar et al., 2020; Guzek et al., 2021).

Restricted outdoor activities, closures of gyms and parks and increased duration of working from home and in front of the screen led to a decrease in physical activity (Cheikh Ismail et al., 2020; Husain & Ashkanani, 2020). In a systematic review conducted by Stockwell et al. (2021), physical activity was found to decrease during COVID-19 shutdowns in most of the studies reviewed (Stockwell et al., 2021).

Long durations of shutdowns, fear of infection, lack of information and financial losses have had negative effects on psychological wellbeing (Bueno-Notivol et al., 2021). These factors, which create stress and anxiety, lead to an impaired quality of sleep (Chopra, Ranjan, Singh, et al., 2020; Sher, 2020; Znazen et al., 2021). Several studies have demonstrated that while sleep duration increased, sleep quality decreased (Alothman et al., 2021; Huancahuire-Vega et al., 2021; Kaur et al., 2021; Kolokotroni et al., 2021).

There has been a limited number of studies on the effect of shutdowns on lifestyle-related behaviours, and most of the studies have focused on nutrition and physical activity (Cheikh Ismail et al., 2020; Chopra, Ranjan, Singh, et al., 2020; di Renzo et al., 2020; Husain & Ashkanani, 2020; Sánchez-Sánchez et al., 2020; Stockwell et al., 2021). To what extent lifestyle-related behaviours are affected can vary with strictness of the measures taken by countries (Ammar et al., 2020). Therefore, further studies are needed to examine all aspects of lifestyle-related behaviours in populations that have different cultures and where different measures are taken (Alothman et al., 2021; Ammar et al., 2020). There have not been any studies examining all aspects of the effect of COVID-19 on lifestyle-related behaviours in Turkey (Güney & Sangün, 2021; Önal et al., 2021; Özenoğlu et al., 2021; Özlem & Mehmet, 2020). This underlines the need for conduction of studies dealing with the effect of COVID-19 on lifestyle-related behaviours in Turkey.

Besides, studies about the effect of COVID-19 on health were conducted in the early phase of the pandemic, and valid and reliable data collection tools were not used in those studies (Cheikh Ismail et al., 2020; di Renzo et al., 2020; Husain & Ashkanani, 2020; Sánchez-Sánchez et al., 2020). Therefore, it can be important to determine the effect of the pandemic on lifestyle-related behaviours in the second year of the pandemic when restrictions are still being imposed in terms of the measures that will be taken. Eradication of a pandemic can take a long time. Therefore, effects of a pandemic on lifestyle-related behaviours can be of importance (Malay, 2020; Rahati et al., 2014). Health professionals should also take initiatives to protect and improve the health of the community during the pandemic.

Public health nurses have the most suitable position which allows performing effective interventions for individuals and the society to prevent unhealthy lifestyle-related behaviours causing chronic diseases (Edmonds et al., 2020; Sargent et al., 2012). Conduction of research by nurses to examine the effect of the pandemic on lifestyle-related behaviours can guide the interventions they will plan. Further studies can help to improve not only health outcomes of behaviours during the pandemic but also public health interventions that will be carried out in case of another restriction on the population (encouragement of physical activity and healthy nutrition, regular and high-quality sleep, etc.) (Sallis et al., 2020; Vessey & Betz, 2020). To our knowledge, there has been no nursing research on the effect of COVID-19 on lifestyle-related behaviours. Therefore, the current study was directed towards examining the effect of COVID-19 on lifestyle-related behaviours concerning nutrition, physical activity and sleep and factors affecting these behaviours.

2 | METHODS

2.1 | Study design

This is a cross-sectional study.

2.2 | Sampling and sample size

Convenience sampling was utilized in this study. Inclusion criteria were age over 18 years, living in Turkey, graduating at least from primary school and accepting to participate in the study. People diagnosed as COVID-19, being pregnant and being dependent on someone else for their daily life activities at the time of data collections were not included in the study.

The sample size was calculated with reference to the mean score on balanced nutrition with its standard deviation in a study by Chopra, Ranjan, Singh, et al. (2020). It was found to be 420 based on the effect size of 0.08, type 1 error of 5% and power of 95%. Since this was a web-based cross-sectional study, accessing more than 420 participants was planned and a total of 1032 people participated in the study. The reason for inclusion of more people in the study than the calculated sample size is that the research is based on the community. In population-based public health research, it is important to explain the relationship between variables and to examine the percentages in a large sample (Lumley et al., 2002). Since four participants were younger than 18 and since eight participants did not fill in the data collection tools completely, they were excluded from the study. As a result, the study sample included 1020 people.

2.3 | Data collection

The data were collected with a web-based questionnaire from individuals living in different regions of Turkey between 8 April and 28 April 2021. At the time of data collection, a stay at home order was imposed in Turkey due to the pandemic throughout weekends and between 7 p.m. and 5 a.m. on weekdays. Public places like restaurants, cafes and parks were shut down and educational institutions like universities, high schools and primary schools offered online education.

The web-based questionnaire was created as a Google form and the link to the form was shared through social media platforms like Facebook, Instagram and WhatsApp and with personal contact lists of the researchers. The participants were also asked to share the questionnaire with other people to increase the sample size.

The data collection tools shared by using a Google form included brief information about the study, the aim of the study and confidentiality of obtained data. Before the participants filled in the tools, their informed consent was obtained online.

2.4 | Data collection tools

Data collection was performed by using a sociodemographic characteristic form and the impact of COVID-19 on lifestyle-related behaviours questionnaire.

2.4.1 | Sociodemographic characteristics form

The sociodemographic characteristics form was created by the researchers in light of the literature. It is a self-report form and composed of questions about education, place of living, occupation, income, marital status, diagnosis of a medical condition, health status and working from home.

2.4.2 | The impact of COVID-19 on lifestyle-related behaviours questionnaire

The impact of COVID-19 on lifestyle-related behaviours questionnaire was developed by Chopra, Ranjan, Malhotra, et al. (2020) to determine the effect of COVID-19 pandemic on lifestyle-related behaviours including eating behaviour, physical activity, sleep pattern and other behaviour. The questionnaire is composed of three sections: A, B and C. Section A includes sociodemographic and

anthropometric parameters. Section B includes two parts: A and B. Each has 24 items. Part A (A1 to A24) is directed towards evaluation of eating habits, physical activity and sleeping pattern before COVID-19, and Part B (B1 to B24) is directed towards evaluating changes in lifestyle-related behaviours during COVID-19. The questionnaire is a 5-point Likert scale. Responses to each item in parts A and B are as follows: *Not routinely*, *One to two times a week*, *Three to four times a week*, *Five to six times a week* and *Almost daily*. The scores for the responses range from five to one. Five corresponds to *Almost daily* (the most acceptable behaviour), and one corresponds to *Not routinely* (the least acceptable behaviour). Items 2–4, 9, 10–12, 16, 18 and 20–24 are scored in the reverse order (*Not routinely* = 5; *Almost Daily* = 1). Section C includes items about the causes of changes in lifestyle-related behaviours typical of COVID-19. Overall, the total percentage of variance was 63.3%. The eigenvalues of the factors eating behaviour, physical activity, sleep pattern and other behaviour are 3.03, 2.05, 1.22, 1.17 and 1.04, respectively. The original questionnaire had good internal consistency, with Cronbach's α of 0.83. In Section B, Cronbach's α for parts A and B was 0.67 and 0.72, respectively.

In parts A and B, there are 12 questions about eating behaviour (regular consumption of meal pattern, fast-food and junk food consumption, portions, frequency of meals, balanced nutrition, type of food consumed, emotional eating, eating very fatty, salty and sugary food and consumption of sugar-sweetened beverages). There are six questions about physical activity including aerobic exercise, doing household chores, free time activities, work-related sitting time and screen time. There are three questions to evaluate sleep pattern and three other questions to evaluate smoking, alcohol intake and support from family and friends.

In order to determine the effect of COVID-19 on lifestyle-related behaviours in Turkey, the impact of COVID-19 on lifestyle-related behaviours questionnaire was translated and adapted. The World Health Organization guidelines for the translation and adaptation of questionnaire were followed (WHO, 2016). The process involved forward translation, back-translation, an expert panel, and pilot study.

Linguistic validity

Translation and back-translation were used to achieve linguistic validity of the questionnaire (Esin, 2015). Three nursing lecturers involved in this study, and a specialist in English language and literature translated the questionnaire into Turkish independently. After that, the Turkish version was translated back into English by one of the English language linguists who had not seen the original questionnaire and had a background in both English and Turkish language and culture.

Content validity

The Content Validity Index (CVI) (>0.80) was calculated to assess the content validity of the instrument (Esin, 2015; Field, 2018). The content validity of the questionnaire was verified by six nursing academicians. The experts were consulted for their opinions after the language adaptation for assessing the content validity of the questionnaire. The Davis technique was used to evaluate the opinions obtained with the CVI (Davis, 1992). In accordance with the expert opinions, the CVI was found to be 0.91. Changes were made in the statements based on the recommendations, and the final version of the questionnaire was created. Instead of foods such as poori, bhujia, matri and fried foods, which are not widely consumed in Turkish cuisine, French fries, stir fry, fried chicken-fish, etc. were written. Ayran and yoghurt, which have a high consumption rate in Turkey, were added as the options of dairy products.

Pilot study

A pilot study was carried out to test the clarity of content, ease of understanding, time required for responses and potential problems. The Turkish version of the translated questionnaire was piloted on 20 individuals meeting the inclusion and exclusion criteria.

In determining the reliability levels of the instrument, Cronbach's alpha reliability coefficient (>0.60) was used (Everitt & Skrondal, 2010). Cronbach's alpha for the questionnaire was found to be 0.82 (α = 0.67 for Part A; α = 0.67 for Part B). The total questionnaire had a high internal consistency.

2.4.3 | Anthropometric data

Self-reported data on height and weight were used to calculate BMI using the Quetelet equation (body mass [kg]/height [m^2]) and interpreted according to the criteria of the World Health Organization (WHO, 2021a).

2.5 | Statistical analysis

Data were analysed with IBM Predictive Analytics Software (PASW) Statistical Product and Service Solutions 22 (SPSS, Chicago, IL, USA). Kolmogorov–Smirnov was utilized to determine whether data had a normal distribution ($p > .05$). Descriptive statistics (frequency and percentage) were employed to analyse data about sociodemographic characteristics and responses to the questions in the questionnaire. Paired sample *t* test was used to determine the difference between the mean scores on lifestyle-related behaviours before COVID-19 and the mean scores during COVID-19. Independent sample *t* test was utilized to determine whether changes in lifestyle-related behaviours differed in terms of sociodemographic characteristics between two groups, and Bonferroni corrected one-way ANOVA was utilized whether the changes were different between three or more groups. The variables found to be significant according to the results of independent sample *t* test and one-way ANOVA were included into multiple linear regression analysis to determine the factors affecting lifestyle-related behaviours. The statistical significance was set at $p < 0.05$.

2.6 | Ethical considerations

The study was conducted according to the Declaration of Helsinki. Ethical approval was obtained from Pamukkale University Ethical

Committee of Non-Interventional Clinical Research (Approval date: 30/03/2021; Approval number: E-60116787-020-40751). Necessary permission for the adaptation of the original questionnaire to Turkish language and culture and its reproduction was obtained from the author creating the questionnaire through e-mail.

3 | RESULTS

3.1 | Sample description

The mean age of the participants was 34.89 ± 21.51 years (range: 19–68 years). A total of 64.20% of the participants were female, and 76.60% of the participants had university education or a higher education level. Atotal of 67.50% of the participants were living in a city, 49.40% of the participants were married and 19.10% of the participants had a chronic disease. The mean self-reported BMI (kg/m^2) was 24.18 ± 3.97 (Table 1).

3.2 | Impact of COVID-19 on lifestyle-related behaviours before and during COVID-19

There was a significant decrease in 'regular consumption of meals pattern' during COVID-19 (−0.13[0.44], $p < 0.001$). Also, a significant increase appeared in unhealthy food consumption including fast food (−0.09[1.40], $p < 0.05$), fried food (−0.12[0.97], $p < 0.001$), junk food (−0.12[0.97], $p < 0.001$), sugar-sweetened beverages (−0.21[0.99], $p < 0.001$) and sugary food (−0.28[1.19], $p < 0.001$). Emotional eating significantly increased due to stress, disappointment and distress (−0.14[1.05], $p < 0.001$) (Table 2).

Daily screen time (−0.45[.85], $p < 0.001$) and work-related sitting time (−0.37[1.18], $p < 0.001$) during COVID-19 significantly increased. While the frequency of leisure activities in the garden or park significantly decreased (−0.31[1.17], $p < 0.001$), there was no change in the frequency of doing 30-min aerobic exercise/sports (−0.16[.47], $p > 0.05$).

Although there was a significant increase in sleeping time during COVID-19 (0.15[0.60], $p < 0.001$), sleep quality decreased (−0.40 [.90], $p < 0.001$). Stress and anxiety levels significantly rose during COVID-19 (−0.68[1.08], $p < 0.001$).

3.3 | Reasons for changes in lifestyle-related behaviours

The causes of changes in eating habits were improved knowledge about nutrition (41.30%), less eating out (40.80%), stress and anxiety (39.80%) and higher cost of ingredients (31.80%). Although some participants had physical activity including going for a walk (43.80%), watching work out videos at home (29.10%) and doing aerobics at home (17.50%), their physical activity dropped due to social restrictions to parks and public places (52.40%), decreased motivation

TABLE 1 Demographic and health-related characteristics of the participants ($n = 1{,}020$)

Characteristics	Value
Age (years)	34.89 ± 21.51
	n (%)
Gender	
Female	655 (64.20)
Male	365 (35.80)
Education status	
Primary school	57 (5.60)
High school	182 (17.80)
University and upper	781 (76.60)
Type of residence	
Village, small town	64 (6.30)
Town	267 (26.20)
City	689 (67.50)
Profession	
Employed for wages	591 (58.00)
Self-employed	98 (9.60)
Unemployed	63 (6.20)
Student	179 (17.50)
Retired	17 (1.70)
Other	72 (7.10)
Income	
Lower	335 (32.84)
Middle	567 (55.58)
Upper	118 (11.58)
Marital status	
Married	504 (49.40)
Single	516 (50.60)
Family status	
Nuclear	928 (91.00)
Extended	92 (9.00)
Chronic illness	
No	825 (80.90)
Yes	195 (19.10)
Self-perceptions of health status	
Good	596 (58.40)
Moderate	381 (37.40)
Bad	43 (4.20)
Working from home during COVID-19 pandemic	
Yes	185 (18.10)
Sometimes	365 (35.80)
No	278 (27.30)
Unemployed	192 (18.80)
Anthropometric parameters	
Self- reported BMI (kg/m^2)	24.18 ± 3.97
Weight gain during COVID-19	579 (56.80)
Weight loss during COVID-19	92 (9.00)

(Continues)

TABLE 1 (Continued)

Characteristics	Value
Stable weight during COVID-19	335 (32.80)
Don't know	14 (1.40)

(48.80%) and inadequate transportation to gyms (38.10%). The causes of changes in sleeping habits were stress and anxiety (51.60%) and daytime sleeping (27.80%). The causes of changes in anxiety and stress levels were fear of COVID-19 infection (63.50%) and worrying about family and friends (61.70%) (Table 3).

3.4 | Differences in lifestyle-related behaviours in terms of general characteristics

As presented in Table 4, there was a significant difference in eating, physical activity, sleep pattern, other behaviours and overall lifestyle scores. The variables found to cause a difference in lifestyle-related behaviours in the one-way variance analysis were included into multiple regression analysis to evaluate their combined effects. The analysis showed that being a university graduate ($\beta = 0.090$), being single ($\beta = 0.071$), living in a village ($\beta = -0.088$), having a low income ($\beta = -0.091$) and gaining weight ($\beta = -0.149$) were predictors of eating behaviours. The predictors of changes in physical activity were being single ($\beta = 0.120$), living in a village ($\beta = -0.069$) and gaining weight ($\beta = -0.055$). Lifestyle-related behaviours were negatively affected in the individuals having low education levels ($\beta = 0.189$), low income levels ($\beta = -0.101$), being single ($\beta = 0.129$), living in rural areas ($\beta = 0.113$), experiencing chronic diseases ($\beta = 0.075$) and gaining weight ($\beta = -0.169$) ($p < 0.05$) (Table 5).

4 | DISCUSSION

This study showed a significant change in adults' eating and physical activity behaviours, sleeping pattern and other behaviours (smoking and social support) when night curfews and weekend shutdowns were imposed in the second year after COVID-19 pandemic started (8–22 April 2021). The extent of the lockdown varied from country to country. Besides, measures taken during different stages of the pandemic and their effects on people's lifestyles were different. Unlike other studies, the current study was carried out in the second year of the pandemic when only night curfews and weekend shutdowns were imposed. Therefore, the results of the study revealed that effects of COVID-19 on lifestyle-related behaviours are not only limited to the lockdown. The results of this study were compared with those of similar studies and discussed as follows.

In this study, the regular consumption of meals patterns significantly worsened during COVID-19 pandemic. The reason for this may be skipping breakfast due to the change in sleep patterns. In a study in Turkey, lunches were found to be more frequently missed due to waking up late in the morning (Turkey Nutrition and Health Research, 2019). Ammar et al. (2020), Alothman et al. (2021) and Cheikh Ismail et al. (2020) found in their studies that the number of meals decreased during COVID-19 pandemic. An increase in the frequencies of eating snacks might have affected eating patterns.

In the current study, a significant increase was found in consumption of fast food, fried food, junk food, sugary food and sugar sweetened beverages during COVID-19 pandemic compared to their consumption before the pandemic. Similarly, several studies performed in some countries during the lockdown at the beginning of the pandemic also revealed a rise in consumption of unhealthy food (Alfawaz et al., 2021; Ammar et al., 2020; Catucci et al., 2021; Górnicka et al., 2020; Sánchez-Sánchez et al., 2020; Scarmozzino & Visioli, 2020). However, some studies have shown an increase in consumption of healthy food during the lockdown (Chopra, Ranjan, Singh, et al., 2020; Guzek et al., 2021; Huancahuire-Vega et al., 2021). The reason for the conflicting evidence can be that measures taken during the lockdown change from country to country and that eating habits differ between cultures.

In the current study, more than half of the participants experienced weight gain during COVID-19 pandemic. Likewise, Özenoğlu et al. (2021) and Önal et al. (2021) found in their studies in Turkey that people gained weight during the pandemic, which was compatible with the evidence from the international literature (Abdulsalam et al., 2021; Catucci et al., 2021; di Renzo et al., 2020; Huancahuire-Vega et al., 2021). Weight gain was attributed to increased unhealthy food consumption and decreased physical activity (Bakaloudi et al., 2021; Zachary et al., 2020).

In the current study, the participants reported that the most significant cause of changes in their eating behaviours was stress and anxiety. In the previous studies conducted during COVID-19 pandemic, most of the negative eating behaviours were associated with psychological conditions like stress, anxiety and boredom (Catucci et al., 2021; Knell et al., 2020; Önal et al., 2021; Scarmozzino & Visioli, 2020). It is stated in the literature that stress can trigger excessive eating and stimulate the desire to eat some food especially desserts (Guzek et al., 2021). Since prolonged social isolation can cause anxiety, boredom and stress, changes in eating behaviours can occur (Bakaloudi et al., 2021; Moynihan et al., 2015; Rodríguez-Pérez et al., 2020).

In the current study, the participants noted that high costs of food and ingredients were the second most important cause of unfavourable changes in eating behaviours. In a study performed in the USA during the pandemic, Knell et al. (2020) also mentioned insufficient resources as a cause of negative health behaviours. Measures taken by governments against the pandemic have created high costs in economic activities (Znazen et al., 2021). Many people in Turkey have also lost their jobs or experienced reductions in their incomes (Özatay & Sak, 2020). For these reasons, financial difficulties experienced by individuals have prevented them from consuming healthy food.

In the current study, the participants had a decreased frequency of free time activities in the garden or park during COVID-19 pandemic and spent significantly longer time sitting and in front of the screen. In other studies conducted in Turkey, the level of physical activity significantly decreased during COVID-19 pandemic (Önal

TABLE 2 The comparison of mean scores of lifestyle-related behaviours before and during COVID-19

No	Question	Before COVID-19 Mean (SD)	During COVID-19 Mean (SD)	Δ change (during-before) mean (SD)	*t*; *p*
	Eating behaviour	3.63 ± 0.53	3.50 ± 0.53	−0.13 ± 0.44	−9.44; <0.001
1	Regular consumption of meals pattern	3.46 ± 1.55	3.37 ± 1.46	−0.09 ± 1.40	−2.07; 0.038
2	Consumption of fast food[a]	4.05 ± 0.73	3.88 ± 0.81	−0.16 ± 0.88	−6.10; <0.001
3	Consumption of fried food[a]	3.88 ± 0.67	3.75 ± 0.87	−0.12 ± 0.97	−4.09; <0.001
4	Consumption of junk food such as snacks[a]	3.69 ± 1.04	3.64 ± 1.07	−0.05 ± 0.85	−1.94; 0.052
5	Frequency of fruits and vegetables intake	3.29 ± 1.17	3.36 ± 1.11	0.07 ± 1.11	2.25; 0.024
6	Having a balanced diet including healthy ingredients (whole wheat, pulses, legumes, eggs, nut, fruits, and vegetables)	3.24 ± 1.21	3.17 ± 1.14	−0.07 ± 1.03	−2.20; 0.028
7	Consumption of milk or dairy products (yoghurt, buttermilk, cheese, kefir etc.)	3.40 ± 1.25	3.41 ± 1.21	0.01 ± 0.98	0.348; 0.728
8	Consumption of one or more servings of pulses, egg or meat per day	3.16 ± 1.12	3.05 ± 1.15	−0.10 ± 0.96	−3.41; 0.001
9	Daily consumption of sugar/honey/molasses[a]	3.89 ± 1.26	3.47 ± 1.48	−0.41 ± 1.35	−9.78; <0.001
10	Consumption of sugar sweetened beverages[a]	3.97 ± 1.12	3.76 ± 1.29	−0.21 ± 0.99	−6.94; <0.001
11	Consumption of foods with high sugar levels[a]	3.52 ± 1.01	3.24 ± 1.03	−0.28 ± 1.19	−7.72; <0.001
12	Emotional eating (boredom/distress/ disappointment)[a]	4.01 ± 0.97	3.86 ± 1.05	−0.14 ± 1.05	−4.45; <0.001
	Physical activity behaviour	2.66 ± 0.57	2.82 ± 0.60	−0.16 ± 0.47	−10.93; <0.001
13	Participation in 30 min of moderate intensity aerobic exercise/sports	2.04 ± 1.10	2.04 ± 1.08	0.00 ± 0.93	0.20; 0.842
14	Participation in household chores (cooking, laundry, cleaning)	2.92 ± 1.46	3.12 ± 1.47	0.20 ± 0.94	6.83; <0.001
5	Participation in leisure activities (grocery shopping, walking in the park, gardening)	2.73 ± 1.13	2.42 ± 1.08	−0.31 ± 1.17	−8.48; <0.001
16	Daily sitting time at work[a]	3.64 ± 1.22	3.26 ± 1.32	−0.37 ± 1.18	−0.44; <0.001
17	Breaks from sitting (such as standing up, or stretching or taking a short walk)	3.13 ± 1.29	3.07 ± 1.24	−0.05 ± 1.05	−1.63; 0.103
18	Daily screen time[a]	2.45 ± 0.85	2.00 ± 0.88	−0.45 ± 0.85	−16.86; <0.001
	Sleep pattern	3.03 ± 0.44	2.71 ± 0.59	−0.31 ± 0.58	−17.02; <0.001
19	Daily hours of sleep	2.00 ± 0.45	2.15 ± 0.60	0.15 ± 0.60	8.01; <0.001
20	Quality of sleep[a]	3.20 ± 0.75	2.80 ± 0.85	−0.40 ± 0.90	−14.43; <0.001
21	Level of stress or anxiety[a]	3.88 ± 0.71	3.20 ± 1.07	−0.68 ± 1.08	−20.18; <0.001
	Other behaviours	4.11 ± 0.80	4.05 ± 0.83	−0.06 ± 0.50	−3.83; <0.001
22	Smoking[a]	4.13 ± 1.48	4.08 ± 1.50	−0.05 ± 0.57	−2.77; 0.006
23	Alcohol consumption[a]	4.48 ± 0.91	4.48 ± 1.00	0.00 ± 0.53	−0.23; 0.814
24	Social support[a]	3.73 ± 1.31	3.60 ± 1.35	−0.13 ± 0.98	−4.36; <0.001
	Total	3.41 ± 0.39	3.26 ± 0.39	−0.15 ± 0.32	−15.12; <0.001

[a]These items are reverse scored.

et al., 2021; Özenoğlu et al., 2021). Night curfews and weekend shutdowns were imposed and education was offered online to all grades of students in Turkey until April 2021 when the present study was performed. Restrictions on parks and public places, closures of gyms, night curfews and shutdowns at weekends were found to reduce physical activity levels. Besides, half of the participants reported working from home, which was another factor reducing physical activity. The significant decrease in physical activity during COVID-19 is supported by the results of studies in other countries (Alfawaz et al., 2021; Cancello et al., 2020; Chopra, Ranjan, Singh, et al., 2020; Zachary et al., 2020). Evidence from both the present study and other studies shows that physical inactivity during the pandemic can create problems (Eyimaya & Irmak, 2021).

In the current study, while the sleep duration significantly increased during COVID-19 pandemic, the sleep quality significantly decreased. The most important factor of the change in the sleeping pattern was

TABLE 3 Reasons for changes in lifestyle-related behaviours

No.	Questions	Frequency of responses *n* (%)
1	**What are the reasons for changes in dietary pattern during COVID-19 in comparison to pre-COVID-19 times?**	
	Improved knowledge about nutrition	**421 (41.30)**
	Lack of access to fresh fruit and vegetables	166 (16.30)
	Higher cost of ingredients	**324 (31.80)**
	Longer cooking time	111 (10.90)
	Better family support	236 (23.10)
	Less eating out	**416 (40.80)**
	Lack of family support	46 (4.50)
	Stress and anxiety	**406 (39.80)**
	Relaxed mind	102 (10.00)
	No change in eating pattern	237 (23.20)
2	**In order to increase your physical activity, which activities have you done?**	
	At-home aerobics	178 (17.50)
	Yoga	73 (7.20)
	At-home workout videos	**297 (29.10)**
	Going to the gym (treadmill, cycle, and weights)	62 (6.20)
	Walks	**447 (43.80)**
	At- home dancing and stretching	144 (14.10)
	Not doing any activities	357 (35.00)
3	**What are the reasons for changes in your physical activity regime during COVID-19?**	
	Lack of motivation	**498 (48.80)**
	Lack of knowledge of exercises	95 (9.30)
	Lack of access to sport facilities and gym	**389 (38.10)**
	Social restrictions on parks and public places	**534 (52.40)**
	Availability of time	299 (29.30)
	Social support	209 (20.50)
	No change in regime	29 (2.80)
4	**What are the reasons for a change in sleeping pattern during COVID-19?**	
	Daytime sleeping	**284 (27.80)**
	Stress and anxiety	**526 (51.60)**
	Long working hours	221 (21.70)
	Environmental factors such as noise and lighting	130 (12.70)
	Shortness of breath during sleep	66 (6.50)
	Flexibility in days time	182 (17.80)
	No change in sleeping pattern	75 (7.40)
5	**What are the reasons for a change in stress and anxiety levels during COVID-19?**	
	Fear of COVID infection	**648 (63.50)**
	Worrying about family and friends	**629 (61.70)**
	Stigmatization or discrimination from other people (e.g., people treating you differently because of your identity, having symptoms, or other factors related to COVID-19)	131 (12.80)
	Frustration/boredom/loneliness	**426 (41.80)**
	Financial loss	306 (30.00)
	Confusion about what COVID-19 is, how to prevent it, or why social distancing/isolation/quarantines are needed	361 (35.40)
	Lack of support from family and friends	81 (7.90)
	No change in stress and anxiety levels	30 (2.90)

TABLE 4 Comparisons of changes in lifestyle Behaviours during COVID-19 pandemic in terms of sociodemographic characteristics

Characteristics Difference between scores	Δ change in eating behaviour mean (SD)	Significant and *p* value	Δ change in physical activity mean (SD)	Significant and *p* value	Δ change in sleep pattern mean (SD)	Significant and *p* value	Δ change in other Behaviours mean (SD)	Significant and *p* value	Δ change in overall lifestyle score mean (SD)	Significant and *p* value
Age										
(1) ≤ 30 ($n = 460$)	−0.14 ± 0.48	$F = 2.019$ $p = 0.133$	−0.12 ± 0.52	$F = 2.492$ $p = 0.083$	−0.30 ± 0.58	$F = 1.127$ $p = 0.324$	−0.01 ± 0.40	$F = 1.667$ <0.001	−0.14 ± 0.31	$F = 3.130$ $p = 0.054$
(2) > 30 to 45 ($n = 424$)	−0.14 ± 0.38		−0.20 ± 0.43		−0.34 ± 0.61		−0.12 ± 0.60	1vs2 < 0.05	−0.18 ± 0.32	
(3) > 45 ($n = 136$)	−0.06 ± 0.47		−0.16 ± 0.47		−0.25 ± 0.49		−0.01 ± 0.41		−0.10 ± 0.32	
Gender										
Female ($n = 655$)	−0.12 ± 0.44	$t = 0.996$ $p = 0.320$	−0.17 ± 0.53	$t = -0.831$ $p = 0.406$	−0.33 ± 0.57	$t = -1.463$ $p = 0.144$	−0.03 ± 0.42	$t = 2.549$ $p = 0.011$	−0.14 ± 0.31	$t = 0.540$ $p = 0.589$
Male ($n = 365$)	−0.15 ± 0.45		−0.14 ± 0.36		−0.27 ± 0.61		−0.11 ± 0.61		−0.16 ± 0.34	
Education status										
(1) primary school ($n = 57$)	−0.42 ± 0.50	$F = 13.252$ <0.001	−0.45 ± 0.38	$F = 12.765$ <0.001	−1.11 ± 0.83	$F = 63.141$ <0.001	−1.04 ± 1.02	$F = 152.984$ <0.001	−0.59 ± 0.52	$F = 62.849$ <0.001
(2) high school ($n = 182$)	−0.09 ± 0.09	1vs2 < 0.05 1vs3 < 0.05	−0.09 ± 0.47	1vs2 < 0.05 1vs3 < 0.05	−0.28 ± 0.54	1vs2 < 0.05 1vs3 < 0.05	−0.69 ± 0.36	1vs2 < 0.05 1vs3 < 0.05	−0.11 ± 0.24	1vs2 < 0.05 1vs3 < 0.05
(3) university and a higher level of education ($n = 781$)	−0.12 ± 0.45		−0.15 ± 0.48		−0.26 ± 0.53		−0.01 ± 0.38		−0.13 ± 0.29	
Type of residence										
(1) village, small town ($n = 64$)	−0.33 ± 0.58	$F = 7.321$ <0.001	−0.20 ± 0.56	$F = 10.220$ <0.001	−0.65 ± 0.05	$F = 24.752$ <0.001	−0.66 ± 10.19	$F = 54.936$ <0.001	−0.38 ± 0.59	$F = 21.716$ <0.001
(2) town ($n = 267$)	−0.11 ± 0.50	1vs2 < 0.05	−0.05 ± 0.37	2vs3 < 0.05	−0.13 ± 0.50	1vs2 < 0.05	−0.03 ± 0.32	1vs2 < 0.05	−0.09 ± 0.30	1vs2 < 0.05
(3) City (689)	−0.11 ± 0.40	1vs3 < 0.05	−0.20 ± 0.50		−0.35 ± 0.53	1vs3 < 0.05 2vs3 < 0.05	−0.01 ± 0.40	1vs3 < 0.05	−0.15 ± 0.28	1vs3 < 0.05 2vs3 < 0.05
Income										
(1) lower	−0.15 ± 0.50	$F = 6.669$ <0.001	−0.12 ± 0.51	$F = 2.893$ 0.056	−0.45 ± 0.71	$F = 20.312$ <0.001	−0.21 ± 0.68	$F = 26.728$ <0.001	−0.19 ± 0.41	$F = 5.988$ <0.01
(2) middle	−0.42 ± 0.01	1vs2 < 0.05 2vs3 < 0.05	−0.19 ± 0.46		−0.21 ± 0.49	1vs2 < 0.05 2vs3 < 0.05	−0.00 ± 0.35	1vs2 < 0.05 1vs3 < 0.05	−0.12 ± 0.26	1vs2 < 0.05
(3) upper	−0.24 ± 0.35		−0.11 ± 0.45		−0.40 ± 0.49		0.09 ± 0.35		−0.19 ± 0.27	
Marital status										
Married ($n = 504$)	−0.16 ± 0.43	$t = -2.348$ <0.05	−0.22 ± 0.46	$t = -4.08$ <0.001	−0.37 ± 0.59	$t = -3.26$ <0.01	−0.10 ± 0.58	$t = -2.85$ <0.01	−0.19 ± 0.34	$t = -4.43$ <0.001
Single ($n = 516$)	−0.10 ± 0.45		−0.10 ± 0.48		−0.25 ± 0.57		−0.01 ± 0.40		−0.10 ± 0.30	

(Continues)

TABLE 4 (Continued)

Characteristics Difference between scores	Δ change in eating behaviour mean (SD)	Significant and *p* value	Δ change in physical activity mean (SD)	Significant and *p* value	Δ change in sleep pattern mean (SD)	Significant and *p* value	Δ change in other Behaviours mean (SD)	Significant and *p* value	Δ change in overall lifestyle score mean (SD)	Significant and *p* value
Family status										
Nuclear ($n = 928$)	−0.13 ± 0.45	$t = -0.329$ P = 0.742	−0.15 ± 0.48	$t = 2.33$ <0.05	−0.28 ± 0.57	$t = 4.65$ <0.001	−0.04 ± 0.50	$t = 3.22$ <0.01	−0.14 ± 0.32	$t = 2.30$ <0.05
Extended ($n = 92$)	−0.11 ± 0.30		−0.27 ± 0.41		−0.58 ± 0.69		−0.22 ± 0.45		−0.22 ± 0.27	
Chronic illness										
No ($n = 195$)	−0.17 ± 0.47	$t = -1.528$ P = 0.127	−0.25 ± 0.50	$t = -2.94$ <0.01	−0.61 ± 0.73	$t = -8.26$ <0.001	−0.29 ± 0.81	$t = -7.27$ <0.001	−0.26 ± 0.45	$t = -5.38$ <0.001
Yes ($n = 825$)	−0.12 ± 0.43		−0.14 ± 0.47		−0.24 ± 0.52		−0.00 ± 0.37		−0.12 ± 0.28	
Self-perceptions of health status										
(1) good ($n = 596$)	−0.09 ± 0.42	$F = 5.118$ <0.01	−0.15 ± 0.46	$F = 6.404$ <0.01	−0.20 ± 0.45	$F = 40.293$ <0.001	−0.00 ± 0.37	$F = 18.071$ <0.001	−0.11 ± 0.26	$F = 20.325$ <0.001
(2) moderate ($n = 381$)	−0.16 ± 0.45	1vs2 < 0.05	−0.14 ± 0.48	1vs3 < 0.05 2vs3 < 0.05	−0.42 ± 0.68	1vs2 < 0.05 1vs3 < 0.05	−0.11 ± 0.62	1vs2 < 0.05 1vs3 < 0.05	−0.18 ± 0.37	1vs2 < 0.05 1vs3 < 0.05
(3) bad ($n = 43$)	−0.27 ± 0.57		−0.41 ± 0.15		−0.87 ± 0.73	2vs3 < 0.05	−0.42 ± 0.58	2vs3 < 0.05	−0.40 ± 0.45	2vs3 < 0.05
Changes in weight during COVID-19 pandemic										
(1) no change ($n = 335$)	−0.06 ± 0.36	$F = 16.621$ <0.001	−0.09 ± 0.46	$F = 5.045$ <0.01	−0.21 ± 0.43	$F = 7.009$ <0.001	−0.02 ± 0.40	$F = 2.879$ <0.05	−0.08 ± 0.26	$F = 20.056$ <0.001
(2) weight loss ($n = 92$)	0.08 ± 0.54	1vs3 < 0.05	−0.53 ± 0.05	1vs3 < 0.05	−0.23 ± 0.69	1vs3 < 0.05	−0.01 ± 0.43	-	−0.01 ± 0.37	1vs3 < 0.05 2vs3 < 0.05
(3) weight gain ($n = 579$)	−0.20 ± 0.45	2vs3 < 0.05	−0.46 ± 0.01		−0.38 ± 0.63		−0.09 ± 0.55		−0.21 ± 0.33	
(4) Don't know ($n = 14$)	−0.06 ± 0.40		−0.13 ± 0.66		−0.14 ± 0.59		0.11 ± 0.64		−0.06 ± 0.18	
Self-reported BMI (kg/m^2)										
(1) < 18.5 ($n = 129$)	−0.06 ± 0.38	$F = 2.906$ <0.05	−0.12 ± 0.57	$F = 2.340$ 0.072	−0.25 ± 0.61	$F = 3.017$ <0.05	−0.04 ± 0.40	$F = 8.515$ <0.001	−0.10 ± 0.27	$F = 6.277$ <0.001
(2) 18.5–24.9 ($n = 477$)	−0.11 ± 0.41	1vs3 < 0.05	−0.14 ± 0.47		−0.26 ± 0.53	-	−0.00 ± 0.36	2vs3 < 0.05	−0.12 ± 0.28	1vs3 < 0.05 2vs3 < 0.05
(3) 25–29.9 ($n = 329$)	−0.18 ± 0.48		−0.21 ± 0.43		−0.37 ± 0.64		−0.17 ± 0.68		−0.21 ± 0.37	
(4) > 30 ($n = 71$)	−0.13 ± 0.44		−0.09 ± 0.55		−0.40 ± 0.61		−0.01 ± 0.34		−0.14 ± 0.37	

Note: F = one-way ANOVA; t = Independent sample t test. Bonferroni <0.05.

TABLE 5 Predictors affecting the lifestyle-related behaviour

Subscale	Variables	*B*	*SE*	Beta (β)	*t*	*P*	*F*	Model (*p*)	R^2	Durbin Watson
Eating behaviour	Constant	−0.228	0.121	-	−1.882	0.060	8.155	<0.001	0.054	2.057
	Education status (university)	0.071	0.030	0.090	2.364	0.018				
	Type of residence (village)	−0.066	0.024	−0.088	−2.682	0.007				
	Income (low)	−0.065	0.027	−0.091	−2.372	0.018				
	Marital status (single)	0.063	0.031	0.071	2.063	0.039				
	Self-perceptions of health status (bad)	−0.046	0.025	−0.059	−1.812	0.070				
	Weight gain (gain)	−0.071	0.015	−0.149	−4.606	<0.001				
	BMI (increase)	−0.008	0.019	−0.015	−0.452	0.652				
Physical activity	Constant	−0.191	0.138	-	−1.385	0.166	7.332	<0.001	0.048	1.940
	Education status (university)	0.056	0.030	0.066	1.855	0.064				
	Type of residence (village)	−0.069	0.026	−0.087	−2.633	0.009				
	Marital status (single)	0.115	0.030	0.120	3.784	<0.001				
	Family status (extended)	−0.075	0.055	−0.045	−1.371	0.897				
	Chronic illness (yes)	0.058	0.040	0.047	1.456	0.146				
	Self-perceptions of health status (bad)	−0.010	0.027	−0.012	−0.378	0.705				
	Weight gain (gain)	−0.055	0.016	−0.108	−3.423	0.001				
Sleep pattern	Constant	−0.769	0.182	-	−4.234	<0.001	14.687	<0.001	0.130	1.871
	Education status (university)	0.181	0.039	0.174	4.674	<0.001				
	Type of residence (village)	−0.067	0.031	−0.068	−2.156	0.031				
	Income (low)	−0.009	0.034	−0.010	−0.268	0.788				
	Marital status (single)	0.097	0.038	0.083	2.537	0.011				
	Family status (extended)	−0.095	0.065	−0.045	−1.452	0.147				
	Chronic illness (yes)	0.251	0.047	0.168	5.317	<0.001				
	Self-perceptions of health status (bad)	−0.179	0.032	−0.176	−5.567	<0.001				
	Weight gain (gain)	−0.041	0.019	−0.065	−2.111	0.035				
	BMI (increase)	0.006	0.024	0.008	0.253	0.800				
Other behaviour	Constant	−1.315	0.161	-	−8.141	<0.001	14.687	<0.001	0.130	1.871
	Age (30 to 45 years)	−0.032	0.026	−0.044	−1.211	0.226				
	Education status (university)	0.243	0.032	0.274	7.541	<0.001				
	Type of residence (village)	0.110	0.026	0.132	4.280	<0.001				
	Income (low)	0.055	0.029	0.069	1.871	0.062				
	Marital status (single)	0.077	0.034	0.077	2.240	0.025				
	Family status (extended)	−0.020	0.054	−0.011	−0.365	0.715				
	Chronic illness (yes)	0.145	0.039	0.113	3.664	<0.001				
	Self-perceptions of health status (bad)	−0.045	0.027	−0.052	−1.688	0.092				
	Weight gain (gain)	−0.022	0.016	−0.040	−1.355	0.176				
	BMI (increase)	0.008	0.020	0.012	0.387	0.699				
Overall lifestyle	Constant	−0.469	0.102	-	−4.585	<0.001	15.807	<0.001	0.125	1.875
	Education status (university)	0.109	0.022	0.189	4.971	<0.001				
	Type of residence	0.145	0.039	0.113	3.664	<0.001				
	Income (low)	−0.057	0.018	−0.101	−3.147	0.002				
	Marital status (single)	0.084	0.022	0.129	3.886	<0.001				
	Family status (extended)	0.000	0.037	0.000	−0.010	0.992				

(Continues)

TABLE 5 (Continued)

Subscale	Variables	*B*	*SE*	Beta (β)	*t*	*P*	*F*	Model (*p*)	R^2	Durbin Watson
	Chronic illness (yes)	0.062	0.027	0.075	2.325	0.002				
	Self-perceptions of health status (bad)	−0.030	0.019	−0.058	−1.556	0.120				
	Weight gain (gain)	−0.059	0.011	−0.169	−5.422	<0.001				
	BMI (increase)	0.003	0.013	0.006	0.198	0.843				

Abbreviations: β, standardized regression coefficient; *p*, the level of statistical significance; R^2, proportion of variation in dependent variable explained by regression model; SE, standard error of coefficient.

daytime sleep. It is also stated in the literature that as the daytime sleep increases, the sleep quality decreases (Kolokotroni et al., 2021; Husain & Ashkan, 2021). The participants in the current study also reported that stress and anxiety led to changes in sleep patterns. They noted that the most frequent causes of their stress and anxiety were the fear of contracting COVID-19, worrying about family and friends and frustration/boredom/loneliness. It is also suggested in the literature that stress and anxiety disrupt the sleep pattern. Elevated stress and anxiety levels can increase the tendency to smoke and take alcohol in addition to disrupting the sleeping pattern (Ammar et al., 2021; Fluharty et al., 2016; Sher, 2020; WHO, 2020b). In the current study, there was a significant rise in smoking during COVID-19 pandemic.

In this study, predictors of lifestyle changes in the COVID-19 pandemic were also examined. Having university education was found to be protective against negative eating and sleeping behaviours and other negative behaviours (smoking, alcohol intake, insufficient social support) during the pandemic. The participants with low education levels were found to have more unfavourable lifestyle-related behaviours, which is consistent with the results of previous research (Cheikh Ismail et al., 2020; Rodríguez-Pérez et al., 2020). Another factor that had an impact on lifestyle-related behaviours was a low-income level. It was found to create a negative effect. Since a low income decreases access to healthy food (fresh fruit and vegetables, nuts, meat products, milk and dairy products), it might have caused the participants to consume carbohydrates more (Büyüksoy et al., 2021; Chopra, Ranjan, Singh, et al., 2020). It has been noted in the literature that income and education are the primary social predictors of health behaviours (Braveman & Gottlieb, 2014; Büyüksoy et al., 2021; WHO, 2021b). Compatible with the literature, the current study showed that education and income were the main predictors of health. Living in a village negatively affected all domains of lifestyle-related behaviours. People living in rural areas in Turkey are poorer than those living in urban areas in terms of many indicators (Bıçkı, 2011). Koçoğlu and Akın (2009) found in their study in Turkey that income and place of residence were predictors of healthy lifestyle-related behaviours.

4.1 | Study limitations

A limitation of the research was conducting the study with only people who could participate in online survey. Recruitment and data collection were performed only with an online questionnaire through social media platforms, resulting in the possibility of response bias. Data on weight and height were collected based on self-report. This might have precluded obtaining reliable data about BMI. Some of the strengths of the study were the large sample size and the use of a valid-reliable measurement tool. Another strength is that the data collection time includes the period when full lockdown was implemented in Turkey during COVID-19.

4.2 | Implications for practice

The finding that restrictions imposed during COVID-19 pandemic produced negative effects on lifestyle-related behaviours can provide guidance in measurements to be taken. It can be suggested that policy makers should take account of negative effects of night curfews, weekend shutdowns and restrictions on going to the parks. People should be allowed to do exercise outdoors by adopting physical distancing at times of night curfews and weekend shutdowns. They should be motivated to act on the suggestions offered by health professionals to maintain healthy lifestyle-related behaviours. Nurses providing first line healthcare services should give education and counselling for continuation of healthy lifestyle-related behaviours by using information and communications technology (e.g., video calls). WHO made some recommendations to support healthy nutrition and maintenance of an active lifestyle during the lockdown (WHO, 2021c). Nurses could follow these recommendations as a guide and play a role in adoption of these recommendations in the society (Edmonds et al., 2020). They should take account of factors creating negative effects on lifestyle-related behaviours like education, income and residing in rural areas while designing interventions. Besides, they should cooperate with support groups and municipalities to help individuals with low incomes unable to access healthy food.

5 | CONCLUSION

This study showed that eating behaviours, physical activity and sleeping patterns of individuals were affected negatively during COVID-19 pandemic. Besides, stress, anxiety and smoking were found to increase. The most frequent causes of changes in lifestyle-related behaviours were stress, anxiety, inadequate motivation and

closures of social recreation and sports areas. Lifestyle-related behaviours were more negatively affected in the individuals having low education and income levels, living in rural areas and experiencing chronic diseases. These factors should be taken into consideration in the interventions to be planned for individuals. It is recommended to implement interventional studies aiming at increasing the positive lifestyle behaviours of individuals. It can also be suggested that further studies with a cohort design should be performed to examine the effects of changes in lifestyle-related behaviours during COVID-19 pandemic on long term health outcomes.

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CONFLICTS OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

AUTHORSHIP STATEMENT

This study was designed and conceptualized by GKA and EK. Analysis of research data was done by EK. GKA, EK and AK contributed in data gathering and interpretation, agreeing on the design and scrutinizing the technical content and write ups of the full manuscript. EK, GKA and AK after final review of the revised version of the manuscript agreed and approved to be submitted for publication.

ETHICS STATEMENT

The study was conducted according to the Declaration of Helsinki. Ethical approval was obtained from Pamukkale University Ethical Committee of Non-Interventional Clinical Research (Approval date: 30/03/2021; Approval number: E-60116787-020-40751). This study was presented as an oral presentation at the 5th International and 23rd National Public Health Congress between 13 and 18 December in Turkey.

DATA AVAILABILITY STATEMENT

The data for this study are available from the corresponding author upon reasonable request.

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