

Vitamin, Mineral Use and Participation in Exercise during the Coronavirus-19 Pandemic Period

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ABSTRACT

Background: Deadly pandemic conditions, last seen in the 1918 Spanish Flu, similarly emerged in 2019 as coronavirus disease (COVID-19) in Wuhan, China. The metabolic status of the host, as influenced by current medical condition and lifestyle, appears to determine the clinical severity of COVID-19.

Aim: The study aims to determine the rates of vitamin, mineral use, and exercise participation before the COVID-19 pandemic period and during the pandemic period.

Methods: Eight hundred and twenty-two people living in the province of Izmir (Turkey) participated in the research. Using the questionnaire method, vitamin, mineral use, and participation in exercise were determined before the Covid-19 pandemic and during the ongoing one-year period. Frequency and Chi-Square Tests were used for statistical evaluation ($p < 0.05$).

Results: According to the results of the statistical analysis, significant increases were detected in the use of vitamins C, D, and zinc during the COVID-19 pandemic compared to before ($p < 0.05$). It was determined that the frequency of participation in the exercise of the participants decreased significantly compared to the pre-COVID-19 pandemic period ($p < 0.05$).

Conclusion: Conclusion: As a result, it was observed that the frequency of participation in exercise decreased and the use of vitamins C, D, and zinc increased. During the ongoing COVID-19 pandemic, participation in healthy nutrition and exercise, which is known to contribute to a stronger immune system, is recommended as in normal conditions.

Keywords: COVID-19, nutrition, exercise

INTRODUCTION

Coronavirus disease (COVID-19), first detected in Wuhan, China in December 2019, is an infectious disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2)^{1, 2}. Since the beginning of COVID-19, states have been trying to reduce the risk of transmission of the disease by taking many precautionary decisions. At the beginning of these decisions; there was social isolation (staying at home) - distance and hygiene measures. However, public health recommendations to contain the spread of SARS-CoV-2 (i.e. stay-at-home orders, closure of parks, gyms, and fitness centers) have the potential to reduce daily physical activity (PA)³.

It is stated that this situation may pose a threat in terms of health problems related to physical inactivity⁴. Exercise affects the immune system and its anti-viral defenses^{5, 6}. Animal experiments administering influenza and herpes simplex viruses 1 (HSV-1) in the respiratory tract have shown that moderate exercise, performed before (i.e. training) or after infection (for a few days before symptom onset), improves morbidity and mortality to the infection^{7, 8, 9}. It is emphasized that regular (up to 45 minutes) and moderate-intensity exercise (150 minutes per week / 30-60% VO₂ max) can be effective in strengthening the anti-inflammatory response, which can help reverse lymphocytopenia in patients with COVID-19^{10, 11}. Literature data show that exercise has important modulatory effects on immune functions. However, it should not be forgotten that the factors determining this modulator effect are the variation in the type, duration, and intensity of the exercise. Regular exercise and increased physical activity do not reduce a person's risk of becoming infected with SARS-CoV-2, but they can reduce a person's symptom severity.

However, to speak with evidence-based data about this protective effect of exercise, randomized clinical trials involving exercise training in high-risk populations for COVID-19 who are likely to show severe symptoms are needed².

Nutrition is a key determinant of health¹². More importantly, nutrition is part of the treatment regimen for acute and chronic diseases and applies particularly to ailments for which an etiologic treatment has not yet been discovered and validated. The metabolic status of the host, as influenced by advanced age, current medical condition, and lifestyle, appears to determine the clinical severity of COVID-19¹³. Dietary advice alone may not be sufficient to secure adequacy for nutrients in certain conditions, including in elderly subjects¹⁴ involving the need for supplements in susceptible segments of populations. However, based on experience from treatments of SARS and other viral infections, it is stated that nutritional supplements administered at an early stage of infection are important to increase host resistance against RNA viral infections, which may include severe COVID-19¹⁵.

The sudden introduction of a state of quarantine means a radical change in the lifestyle of the population^{16, 17}. As in the whole world, the pandemic process in Turkey has caused changes in people's daily lifestyles. For individuals to survive this process healthily, it is thought that it is important to know the rates of vitamin, mineral use, and exercise participation during the COVID-19 pandemic period. The study aims to determine the vitamin, mineral use, and exercise participation rates of the participants living in Izmir (Turkey) before COVID-19 and during the one-year pandemic period (June 2020-June 2021).

MATERIAL & METHODS

Participants: Eight hundred and twenty-two people living in the province of Izmir (Turkey) participated in the study. Using the questionnaire method, vitamin, mineral use, and participation in exercise were determined before the Covid-19 pandemic and during the ongoing one-year period.

Procedure: It has been determined that 577 questionnaires will represent the city of Izmir¹⁸ which has a population of 4 million 394 thousand people, at the level of 99% confidence interval with a 5% margin of error¹⁹. Within the scope of the study, 822 questionnaires were collected. The gender, age, body weight, height, and educational status of the participants were evaluated as numerical and percentage distribution information. Regular drug use of the participants was determined. The frequency of vitamin and mineral use and participation in exercise were determined before the pandemic and during the ongoing one-year pandemic period. It was analyzed whether there was a difference in these data during the pre-pandemic and ongoing one-year pandemic period (June 2020-June 2021).

Statistical Analysis: Statistical analysis of the research was carried out with the SPSS 23.0 (SPSS Inc., Chicago, IL) program. Frequency analysis and Chi-Square Tests were used for statistical evaluation. The significance level was determined as $p < 0.05$.

RESULTS

In this study, we carried out to determine the levels of vitamin, mineral use, and participation in exercise before and during the Covid 19 pandemic; 474 participants (57.7%) were female and 348 (42.3%) were male. 124 participants (15.1%) were in the age range of 0-18, 408 participants (49.6%) were in the age range of 19-35, 195

participants (23.7%) were in the age range of 36-50, 91 participants (11.1%) were in the age range of 51-70, 4 participants (0.5%) were over 70 years old. 6 participants (0.7%) between 15-35 kg body weight, 157 participants (19.1%) between 36-56 kg body weight, 456 participants (55.5%) between 57-77 kg body weight, 179 participants (21.8%) 78- Between 99 kg body weight and 24 participants (2.9%) were above 99 kg body weight. The height data of the participants, respectively, were as follows; 4 participants (0.5%) were between 121-141 cm, 142 participants (17.3%) were between 142-161 cm, 528 participants (64.2%) were between 162-182 cm and 148 participants (18%) were over 180 cm. While 632 participants (76.9%) had university and postgraduate education, 190 participants (23.1%) had high school and below education level. The data on the regular drug use of the participants are shown in Table 1.

Table 1. Numerical and Percentage Distribution Data of the Drugs Used Regularly by the Participants.

Drug Type	Frequency	Percent (%)
Blood pressure	40	4.9
Sugar	20	2.4
Cholesterol	16	1.9
Painkiller	26	3.2
Vitamin	120	14.6
Mineral	40	4.9
Other	88	10.7
I do not use	586	71.3

The numerical and percentage distribution data of the vitamins and minerals used by the participants regularly are shown in Tables 2 and 3.

Table 2. Numerical and Percentage Distribution Data on the Types of Vitamins Regularly Used by the Participants.

Type of vitamin	Regular Use of Vitamin Before The Pandemic		Regular Use of Vitamin During The Pandemic		Chi Square	p
	Frequency	Percent (%)	Frequency	Percent (%)		
Vit A	19	2.3	23	2.8	0.391	0.320
Vit B	60	7.3	67	8.2	0.418	0.290
Vit C	101	12.3	169	20.6	20.491	0.000*
Vit D	143	17.4	167	20.3	2.290	0.073
Vit E	22	2.7	25	3.0	0.197	0.384
Other	46	5.6	2	0.2	41.521	0.000*
I do not use	586	71.3	625	76.0	0.027	0.457

Vit; Vitamin. * $p < 0.001$

Table 3. Numerical and Percentage Distribution Data on the Types of Minerals Regularly Used by the Participants.

Type of mineral	Regular Use of Mineral Before The Pandemic		Regular Use of Mineral During The Pandemic		Chi Square	p
	Frequency	Percent (%)	Frequency	Percent (%)		
Selenium	19	2.3	15	1.8	0.481	0.302
Zinc	53	6.4	86	10.5	8.558	0.002**
Calcium	40	4.9	50	6.1	1.175	0.165
Iron	61	7.4	58	7.1	0.082	0.425
Magnesium	96	11.7	93	11.3	0.054	0.439
Other	45	5.5	28	3.4	4.143	0.027**
I do not use	621	75.5	625	76.0	0.053	0.431

** $p < 0.005$

Numerical and Percentage Distribution Data regarding the frequency of exercise of the participants are shown in Table 4.

Table 4. Numerical and Percentage Distribution Data on Exercise Participation.

Weekly Participation	Frequency Of Participation in Exercise Before The Pandemic		Frequency Of Participation in Exercise During The Pandemic		Chi Square	p
	Frequency	Percent (%)	Frequency	Percent (%)		
Everyday	86	10.5	76	9.2	0.685	0.228
6 Days a week	116	13.9	59	7.2	19.542	0.000*
5 Days a week	138	16.8	88	10.7	12.825	0.000*
4 Days a week	122	14.8	90	10.9	5.454	0.011**
3 Days a week	152	18.5	133	16.2	1.532	0.120
2 Days a week	67	8.2	45	5.5	4.637	0.020**
1 Day a week	10	1.2	24	2.9	5.886	0.011**
Sometimes	51	6.2	74	9.0	4.580	0.020**
None	82	10.0	233	28.3	89.541	0.000*

* p<0.001, **p<0.005

DISCUSSION

In this study, we conducted to determine the levels of the vitamin, mineral use, and participation in exercise before and during the Covid 19 pandemic; significant increases were detected in the use of C, D, and zinc during the COVID-19 pandemic compared to the past (p<0.05). It was determined that the frequency of participants' participation in exercise decreased significantly compared to the pre-COVID-19 pandemic period (p<0.05).

In particular, this period, in which we are in the process of the COVID-19 pandemic, which has affected the whole world, undoubtedly shows once again the importance of exercise and nutrition in our lives. Gençalp (2020) stated that with the measures are taken to control the spread of the epidemic, dietary habits, physical activity levels, consumer behaviors, education-teaching methods, and daily life have changed rapidly²⁰. The responsibility of individuals to support the immune system during the COVID-19 epidemic has been stated as choosing a healthy lifestyle, eating rich in fruits and vegetables, exercising in their spare time, trying to maintain healthy body weight, and sleeping adequately²¹. Qin et al (2020) determined the impact of the Covid-19 epidemic on the lifestyle in China and determined that the epidemic negatively affected the physical activity of individuals and adopted an unhealthy and sedentary lifestyle in which the time spent in front of the screen was prolonged²². Ismail et al. (2020) evaluated the nutritional habits and lifestyles of individuals living in the North Africa (MENA) region during the epidemic period and found that individuals consumed more meals than normal, increased body weight, and decreased physical activity²³. Alhusseini and Alqahtani (2020) determined the effect of the Covid-19 epidemic on eating habits in Saudi Arabia and found that the eating habits of the participants changed significantly during the epidemic period²⁴. Kriaucioniene et al. (2020) In a study examining the health behaviors and changes in body weight of individuals during the Covid-19 quarantine period in Lithuania, it was determined that the participants ate more food than usual at home during the restriction period, they snacked more, they ate more often at home, there was an increase in weight gain and a decrease in the level of physical activity²⁵. In his research, Macit (2020) determined that after the Covid-19 epidemic, there were changes in the eating habits of adults, a decrease in physical activity levels, and an increase in the use of supplements²⁶. In a different study, Kanik (2020) states that there are changes in physical activity behaviors globally due to the prolonged stay at home during the

Covid-19 pandemic period, and this situation adversely affects the physical and mental health of people²⁷. López-Bueno et al (2020) determined in their study that there was a significant decrease in the physical activity of Spanish individuals during the quarantine period during the Covid-19 epidemic period²⁸. Ciddi and Yazgan (2020) investigated the effect of physical activity status on the quality of life during social isolation during the Covid-19 epidemic and found that the majority of the participants were inactive in terms of physical activity levels compared to the pre-pandemic period²⁹. Tunç et al (2020) investigated the effect of exercise on the quality of life during the Covid-epidemic period and found that the quality of life of individuals who exercise is higher than those who do not³⁰.

When the literature findings were examined,^{22, 23, 25, 26, 27, 28, 29} it was determined that the level of exercise or being physically active decreased during the pandemic period, in line with our study. In addition, in our study, it was observed that physical activity levels decreased and supplement use increased in line with the study of Macit (2020).

It is thought that the restrictions and quarantine processes applied during the pandemic period negatively affect the regular physical activity habits and diets of individuals. Another negative result of the inactivity that emerged in the COVID-19 pandemic is that it encourages people to consume more food. Overeating is associated with increased fat deposition, greater muscle loss, and activation of systemic inflammation. Therefore, the role of diet should not be forgotten along with exercise recommendations. Nutrition is becoming a very popular topic during the COVID-19 pandemic process and studies reveal that quarantine triggers many unhealthy eating behaviors^{31, 32}. In this context, experts and health institutions offer suggestions on how proper nutrition should be and try to raise awareness of the public on this issue. Because it has been proven that a healthy and balanced diet strengthens the immune system with physical activity and regular sleep³³.

CONCLUSION

We think that it is very important for World Health Organization (WHO) to develop strategies for regular physical activity and healthy nutrition to protect and maintain health unless contraindications occur, and that these strategies are processed in national health systems.

Limitations: This study was carried out only with participants in the province of Izmir (Turkey). It is thought

that it would be beneficial to conduct studies involving more participants and the region.

Conflict of Interest: The authors confirm that this article's content has no conflicts of interest.

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