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May the Force be with you during the quarantine: A cross-sectional study on the perception of health *locus* of control, sports engagement and emotional eating of individuals who exercised regularly

Que a Força esteja com você durante a quarentena: um estudo transversal sobre a percepção do locus de controle da saúde, engajamento esportivo e alimentação emocional de indivíduos que se exercitam regularmente

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ABSTRACT

Objective

This study evaluated the perception of health locus of control, sports engagement, and emotional eating during quarantine of individuals who regularly exercised before the quarantine.

Methods

Individuals who regularly attended the gym before the quarantine period were enrolled in the study. The questionnaire included the Multidimensional Health Locus of Control Scale-A, Sport Engagement Scale, and Emotional Eating Scale, which was applied online to 513 gym members.

Results

74.9% of participants adopted the perception of internal health locus of control. Emotional eating scores were higher in participants who did not exercise during the quarantine when compared to those who did and in those adopting the perception of chance health locus of control compared to participants adopting the perception of internal health locus of control. Participants who adopted the perception of internal health locus of control compared to the those who adopted the perception of chance or powerful others health locus of control had

higher sports engagement (p<0.05). Individuals with a high BMI, who did not have a perception of internal health locus of control and who did not exercise during the quarantine were prone to emotional eating.

Conclusion

In conclusion, in those individuals who regularly went to gym before the quarantine, continuing to exercise during the quarantine may have provided an advantage in preventing emotional eating, and we also showed that sports engagement supported the continuation of exercise during the quarantine period. In addition, we determined that individuals with a high body mass index, who do not have a perception of internal health locus of control and who did not exercise during the quarantine were prone to emotional eating.

Keywords: COVID-19. Fitness Centers. Locus of control. Nutrition. Quarantine. Sports.

RESUMO

Objetivo

Este estudo avaliou a percepção do locus de controle da saúde, entre o envolvimento em esportes e comer emocional durante a quarentena de indivíduos que se exercitavam regularmente antes do período de isolamento.

Métodos

Indivíduos que frequentavam regularmente a academia antes do período de quarentena foram incluídos no estudo. O questionário incluiu: a Escala Multidimensional de Locus de Controle da Saúde, Escala de Envolvimento em Esportes e Escala de Comer Emocional. Esse estudo foi aplicado online a 513 membros da academia

Resultados

74,9% dos participantes que adotaram a percepção locus de controle da saúde interno. As pontuações do comer emocional foram mais altas em participantes que não se exercitaram durante a quarentena, em comparação com aqueles que fizeram, e aqueles que adotaram a percepção de locus de controle da saúde de chance, em comparação com participantes que adotaram a percepção de locus de controle da saúde interno. Participantes que adotaram a percepção de locus de controle da saúde interno tiveram um maior envolvimento em esportes em comparação com aqueles que adotaram a percepção de locus de controle da saúde de chance ou de poder de outros (p<0,05). Indivíduos com um alto IMC, que não tinham a percepção de locus de controle da saúde interna e que não se exercitaram durante a quarentena estavam mais propensos à comer emocional.

Conclusão

Em conclusão, naqueles indivíduos que frequentavam regularmente a academia antes da quarentena, continuar se exercitando durante a quarentena pode ter fornecido uma vantagem em termos de prevenção da Escala Comer Emocional, e também mostramos que o engajamento esportivo apoiou a continuação do exercício durante o período de quarentena. Além disso, determinamos que indivíduos com alto índice de massa corporal, que não têm percepção do locus de controle interno da saúde e que não se exercitam durante a quarentena eram propensos a Escala Comer Emocional.

Palavras-chave: *COVID-19. Academias esportivas. Local de controle. Nutrição. Quarentena. Esportes.*

INTRODUCTION

Quarantine is the isolation and restriction of movement of people who have been exposed to a potentially contagious disease to determine whether they are sick or not [1]. With the emergence of Coronavirus Disease 2019 (COVID-19) worldwide, the quarantine implemented to control transmission caused radical changes in individuals' lifestyles. Moreover, the psychological impact of the quarantine has recently been reviewed, and certain adverse psychological effects have been reported, including symptoms of post-traumatic stress, anger, and confusion [2]. Furthermore, with these psychological impacts, decreased physical activity and poor dietary choices during the COVID-19 quarantine have been associated with negative mood [3]. Although it has been reported that the harm caused by coronavirus is related to the age, gender, race, and medical conditions of the individual, lifestyle habits before and during the quarantine are also determining factors in the severity of the COVID-19

disease [4]. Therefore, a healthy diet and regular exercise during the quarantine period may also protect against the physiological effects of COVID-19 and the negative psychological effects of quarantine [5,6].

Locus of control is a concept in social psychology that refers to an individual's perception concerning the underlying main causes of events in their life and whether they attribute these results to their own control and power, or external forces such as chance and destiny [7]. The health locus of control measures a person's belief that they have control over a disease or its consequences [8]. Individuals with the perception of internal locus of control are more active people who believe that they can control the disease process and its outcome as a result of their own actions. On the contrary, individuals who believe that chance and destiny controls everything and that it is the external forces that affect their lives, mainly believe that nothing they do to improve their health will affect their diseases [9]. While individuals with a perception of internal health locus of control are associated with positive health behaviours, individuals with a perception of external health locus of control are associated with negative health behaviours [10]. It has been reported that those who exercise regularly have a perception of internal locus of control [11-13], while those who do fewer sports activities have a higher perception of chance locus of control [14]. Psychosocial factors like engaging in personal interactions, establishing connections with others, working environment, and accessibility have an important role in the lifestyles of individuals. Individuals that demonstrate an internal locus of control are likelier to adopt and adhere to healthy dietary practices and consistently engage in physical exercise [15,16]. Exercise is recognized as a fundamental psychosocial necessity. It has been reported that physical activity significantly reduces depressive symptoms [17,18], relieves anxiety [19] and reduces binge eating [20] and emotional eating [21].

Sports engagement is a continuous and consistent experience in a sports setting, including concepts such as belief, effort, energy and pleasure [22]. Engagement is also called a positive state that emerges with vitality, internalization and dedication [23]. While internal motivation factors have a very important effect on participating, engaging and continuing with sports, it is the external motivation factors that are generally regarded as the driving force in initiating participation in sports [24]. The stimuli that motivate and trigger people vary and for this reason, not every stimulant may be equally effective for every person. To motivate people, both internal and external motivational stimuli must overlap [25]. Considering that external motivation factors have declined during the quarantine period, individuals with an internal locus of control may have engaged more in sports. In addition, Downward and Riordan [26] emphasize that the main motivation determining active participation in sports is to create social environments.

Being physically active before and during the COVID-19 quarantine is linked to better mental health [27,28]. It has been observed that during the COVID-19 quarantine there was a decrease in physical activity [29]; this was due to the fact that individuals were made to stay at home and also that gyms were closed [30]. It has been reported that various social and demographic factors contribute significantly to decreased physical activity among pre-pandemic physically active individuals, including living alone, low household income, changes in income due to COVID-19, and losing one's job [31,32]. However, it has also been reported that certain individuals who had an active life before continued to be active during quarantine [33]. It is emphasized that adopting an active life in every stage of life can have positive effects during the quarantine process [34].

This study aimed to evaluate the status of exercise, sports engagement, emotional eating and health locus of control during the quarantine among persons who had maintained a regular exercise routine before to the quarantine.

METHODS

The study was carried out in Ankara, Turkey. In March 2020, the Turkish government implemented quarantine measures and imposed a curfew in response to the outbreak of COVID-19. Additionally, all gyms are closed indefinitely. The research was conducted during the COVID-19 quarantine period between March and June 2020. Five hundred and thirteen recreational athletes who regularly attended different gyms before the lockdown and volunteered to participate in the research were included in the study. The researcher established contact with trainers/fitness coaches employed at gyms through personal connections. The inclusion criteria were using the gym for at least two days a week, for at least 2 hours recreationally or professionally before the quarantine, and being between the ages of 18-65. Not exercising during the lockdown was not an exclusion criterion. The questionnaire form was applied to the participants via online platforms (WhatsApp, Instagram, and Facebook) due to quarantine conditions. Participants completed the questionnaire in approximately 15 minutes using their computers or mobile phones.

The study protocol was approved by Ankara Medipol University-GOKAEK number 0020, dated 05/13/2020 and was conducted by the Declaration of Helsinki. All respondents read the written consent form and explicitly agreed to participate before starting the survey. Since the research was conducted during the COVID-19 period, the necessary permission was obtained from the Ministry of Health.

A form containing questions created by the researchers and a questionnaire form comprising three scales were used to evaluate health locus of control, emotional eating and sports engagement. The questionnaire form was divided into five sections: 1) Demographic (age, gender, income) and health information, nutritional habits, 2) Anthropometric measurements, 3) Emotional Eating Scale (30 items), 4) Sport Engagement Scale (15 items), and 5) Multidimensional Health Locus of Control Scale-A (18 items)

Demographic and health information, nutritional habits; Participants' age, gender, education level, and the location of work during the lockdown (from home or the office) were questioned. Nutritional habits and the number of main meals and snacks were also questioned. Smoking, alcohol consumption, and exercise habits were recorded.

Anthropometric Measurements; The participants self-reported body weight and height values due to the quarantine conditions. Body mass index (BMI) was calculated by dividing the weight (kg) by height (m^2). Participants were then classified into four categories, based on their BMI: underweight (<18.5 kg/m^2), normal (18.5-24.9 kg/m^2), overweight (25.0-29.9 kg/m^2), and obese (30.0 kg/m^2) [35].

The Emotional Eating Scale was developed by Bilgen [36] to determine the relationship between eating and emotion. The scale was specifically designed and validated for individuals of Turkish people, hence establishing its validity and reliability within this population. This five-point Likert-type scale consists of 30 items. Higher emotional eating scores are related to emotional eating. The scale is scored between 30-150. The Cronbach's Alpha coefficient of internal consistency of Emotional Eating Scale was found to be 0.96 [36]. The Cronbach's Alpha reliability coefficient of this study was 0.93.

Sport Engagement Scale; The original form of the scale, which is the "The Utrecht Work Engagement Scale", was developed by Schaufeli et al. [23]; while the Spanish version was adapted for athletes by Guillen and Martínez-Alvarado [37]. The scale measures sports engagement consists of 15 items, and is structured in a 5-point Likert-type scale in three sub-dimensions. As the scores obtained from the scale increase, sports engagement increases respectively. As a result of the

reliability analysis, Cronbach's Alpha reliability coefficient was calculated as 0.96 for the Sports Engagement Scale and the combined reliability index was calculated as 0.82 within the scope of this study. The Sport Engagement Scale was used to question the commitment of individuals to recreational sports during the lockdown The validity and reliability of the scale in Turkish was determined by Sırgancı et al. [38].

Wallston et al. [39] had originally developed two forms of the Multidimensional Health Locus of Control (MHLC) scale, namely Forms A and B. Form A was used for healthy individuals, while Form B was used for individuals with chronic conditions. The questions in the MHLC-A form were intended to determine whether individuals adopted more internal control, chance control or control of other powerful people (healthcare professionals, family and friends) regarding their health behaviour and included the three following factors: 1) Internal Health Locus of Control (IHLC): I can control my health, 2) Chance Health Locus of Control (CHLC): Chance plays a big role in determining when I will recover from the disease, and 3) The Powerful Others Health Locus of Control (PHLC): I should consult a healthcare professional when I feel unwell.

The MHLC-A form consisted of 18 items and is a six-point Likert-type scale. This form, which evaluated perceptions regarding internal control, external control (chance) and the control of other powerful people, was divided into three sub-dimensions consisting of six items. The degree of participation in the statements in the items is scored from 1 to 6. The average total participation in items was 36 while six was the lowest. Averages for the locus of control perception levels were evaluated among these scores. Each sub-dimension in the scale was scored independently from the other. As a result of scoring, the dimension with the highest score was considered the center that actually controlled health [39]. The validity and reliability of the scale in Turkish were determined by Güzel et al. [40].

The IBM®SPSS® software, version 23.0 statistical package program was used to evaluate the data. Continuous variables obtained by measurements were presented with mean and standard deviation values, and categorical variables were presented with frequency and percentage values. The suitability of quantitative variables to normal distribution was examined using the Kolmogorov-Smirnov or Shapiro-Wilk test. In the evaluation of quantitative variables. Independent samples *t*-test was used for the comparison of two independent groups for the variables for which parametric test conditions were met, and Tukey multiple comparison test was used together with one-way ANOVA for the comparison of three or more independent groups. In cases where the parametric test conditions were not met, Mann-Whitney U-test was used for the comparison of two independent groups, and Kruskal-Wallis H test and Mann-Whitney U were applied to compare three or more independent groups. Two-way variance test ANOVA was used to see the effect of age and gender on the scales.

RESULTS

Demographic characteristics and other descriptive information of the participants are presented in Table 1. Of the participants, 68.2% were female, 31.8% were male, and more than half (56.3%) had a normal BMI. While 68% of the individuals were employed, 72.5% worked only from home. The mean age of the participants was 29.5±8.91 years. While 76% of the participants exercised during quarantine, 24% did not. According to the health locus of control, 74.9% of the participants adopted the perception of internal locus of control, 21.2% the perception of powerful others, and 3.9% the perception of chance locus of control (Table 1).

Table 1 – Demographic and health information and nutritional habits of the participants. Ankara, Turkey, 2020. (n=513).

Information	n	%
Gender		
Man	163	31.8
Woman	350	68.2
Body Mass Index		
Underweight	18	3.5
Normal	289	56.3
Overweight	147	28.7
Obese	59	11.5
Income		
Income<Expense	89	17.3
Income= Expense	293	57.1
Income> Expense	131	25.6
Working status		
Yes	349	68.0
No	164	32.0
Working status during quarantine (n=349)		
Some working days	68	19.8
Weekdays	28	8.0
Remote working	253	72.5
Doing exercise during quarantine		
Yes	390	76.0
No	123	24.0
Number of exercised days (weekly) (n=390)		
1-2 days	29	7.4
3-4 days	186	47.7
5-6 days	128	32.8
Everyday	42	10.8
Other	5	1.3
Exercise time in a day (n=390)		
½ -1 hour	49	12.6
1-2 hours	273	70.0
More than 2 hours	68	17.4
Perception of Health Locus of Control		
Internal	384	74.9
Chance	20	3.9
Powerful others	109	21.2
Educational status		
Literate	3	0.6
Primary school	5	1.0
Secondary school	17	3.3
High school	125	24.4
University	331	64.5
Postgraduate	32	6.2
Chronic disease		
Yes	119	23.2
No	394	76.8
Alcohol consumption		
Yes	232	45.2
No	281	54.8
Smoking		
Yes	259	50.5
No	254	49.5
Number of main meal		
1	16	3.1
2	339	66.1
3	132	25.7
>3	26	5.1
Number of snack		
None	29	5.7
1	178	34.7
2	184	35.9
3	91	17.7
>3	31	6.0

Table 2 compares the emotional eating scores of individuals with various variables (exercise during quarantine, gender, perception of HLC, income status, BMI). Participants who did not exercise during the quarantine period compared to those who did, and female participants compared to males, had higher emotional eating scores ($p<0.05$). It was determined that those adopting the perception of chance locus of control exhibited more emotional eating behaviour than those adopting the perception of internal locus of control. It was observed that participants who were obese compared to those who were underweight, normal weight or overweight; and overweight participants compared to the normal weight participants exhibited more emotional eating behaviours ($p<0.05$), (Table 2).

Table 2 – Comparison of emotional eating scale scores with some variables. Ankara, Turkey, 2020.

Variable	n	Mean±SD	test *p*	Difference
Exercise during quarantine				
Yes	390	71.2±19.7	4.03	
No	123	79.9±25.0	<0.001**t***	
Gender				
Man	163	65.3±17.7	6.36	
Woman	350	78.1±23.1	<0.001**t***	
Perception of health locus of control				
Internal(1)	384	72.2±20.3	4.28	1-2
Chance(2)	20	83.7±28.0	0.014**F***	
Powerful others(3)	109	76.9±23.8		
Income status				
Income<Expense(1)	89	79.9±24.2	4.53	1-3
Income= Expense (2)	293	73.4±21.7	0.011**F***	
Income> Expense (3)	131	70.9±19.5		
Body mass index (kg/m^2)				
Underweight(1)	18	64.5±19.4	13.53	1-4
Normal(2)	289	70.7±19.8	<0.001**F***	2-3
Overweight(3)	147	76.7±22.7		2-4
Obese (4)	59	88.8±26.3		3-4

Note: ***$p<0.05$. **F**One-way analysis of variance (ANOVA); **t**Independent samples *t*-test; SD: Standard Deviation.

Table 3 compares the sport engagement scale scores of individuals with various variables. It was determined that participants with normal BMIs were more engaged in sports than those who were slightly overweight or overweight. It was determined that participants who exercised during the quarantine period compared to the ones who did not, and male participants compared to female participants, had higher levels of sports engagement ($p<0.05$).

It was observed that the participants who adopted the perception of the internal locus of control were more engaged in sports than those who adopted the perception of chance locus of control or the powerful others locus of control ($p<0.05$). It was found that participants who exercised for 2 hours or more per day had higher levels of sports engagement compared to the participants who exercised for ½-1 hour or 1-2 hours per day (Table 3).

It was determined that the emotional eating ($F=18.21$, $p<0.001$) and sports commitment scores ($F=15,69$, $p<0.001$) of the participants showed a significant difference according to gender. Accordingly, women's emotional eating scores (78.1±24.1) are higher than men's emotional eating scores (65.3±17.7) (Table 2). Sports commitment scores of man (59.5±11.7) were higher than women's sports commitment scores (51.2±15.9).

Table 3 – Comparison of sport engagement scale scores with some variables. Ankara, Turkey, 2020.

Variable	n	Mean±SD	Rank Average	Test *p*	Difference
Income status					
Income<Expense(1)	89	50.1±17.67		5.99	1-3
Income= Expense (2)	293	73.4±21.69		0.003F*	
Income> Expense (3)	131	71.0±19.49			
Body mass index (kg/m²)					
Underweight(1)	18	56.4±11.28		11.73	2-3
Normal(2)	289	57.1±12.93		0.000F*	2-4
Overweight(3)	147	50.2±16.87			
Obese (4)	59	47.4±17.66			
Exercise during quarantine					
Yes	390		286.8	12793.5	
No	123		164.7	0.000MWU*	
Gender					
Man	163		309.9	19896.0	
Woman	350		232.4	0.000MWU*	
Perception of health locus of control					
Internal(1)	384		261.3	21.43	1-2
Chance(2)	20		135.7	0.000KW*	1-3
Powerful others(3)	109		215.3		
Number of exercised days (weekly)					
1-2 days(1)	29		158.8	7.23	
3-4 days(2)	186		184.2	0.065KW	
5-6 days(3)	128		207.9		
Every day(4)	42		210.4		
Exercise duration in a day					
½ -1 hour(1)	49		124.5	34.08	1-3
1-2 hour(2)	273		189.1	0.000KW*	2-3
≥2 hour(3)	68		249.1		

Note: ***p*<0.05. FOne-way analysis of variance (ANOVA); KWKruskal-Wallis test; MWUMann Whitney U test, SD: Standard Deviation.

Emotional eating scores of the participants did not show a significant difference according to age (F=0.67, *p*=0.413). In contrast, their sports commitment scores showed a significant difference according to age (F=4.86, *p*=0.028). Accordingly, it was determined that the sports commitment scores of participants aged 34 and under (54.73±15.05) were higher than the scores of participants aged 35 and over (50.98±15.32). When the results of the analysis regarding the joint effect of age and gender were examined, it was determined that the effects of age and gender variables on the participants' emotional eating (F=0.32, *p*=0.575) and sports commitment (F=1.22, *p*=0.270) scores were not significant (Table 4).

Table 4 – Emotional eating and sports engagement scores by gender and age. Ankara, Turkey, 2020.

Questionnaire/Variable	Total Sum of Squares	df	Mean Square	F	*p*
Emotional Eating					
Gender	8453.45	1	8453.45	18.21	<0.001
Age	311.46	1	311.46	0.67	0.413
Gender*Age	145.81	1	145.81	0.32	0.575
Error	224255.23	483	464.30		
Total	239092.89	487			
Sport Engagement					
Gender	3375.29	1	3375.29	15.69	<0.001
Age	1045.57	1	1045.57	4.86	0.028
Gender*Age	262.42	1	262.42	1.22	0.270
Error	103874.91	483	215.06		
Total	112144.05	487			

Note: df: Degree of Freedom; F: Two-way Anova.

It was determined that there was a low correlation between sports engagement and emotional eating (r=-0.162). The eta coefficient showed a low correlation with emotional eating as the dependent variable and health locus as the independent variable (0.134). In addition, the eta coefficient showed a low correlation with sports engagement as the dependent variable and health locus as the independent variable (0.190).

DISCUSSION

The COVID-19 pandemic has placed unprecedented restrictions, affecting individuals' lifestyle behaviors. Brooks et al. [2] reported that the COVID-19 quarantine produced negative psychological effects, including symptoms of post-traumatic stress, confusion, and anger. It is widely recognized that such negative situations trigger emotional eating [41]. During the COVID-19 quarantine, daily physical activity decreased and sedentary time increased [42] . For this reason, interventions aiming to increase physical activity and reduce sedentary time during the quarantine process have gained importance for the protection of health [43]. Since physical activity can improve mood and mental health [44], it can be used as a coping strategy during a pandemic. In addition, physical activity is effective on depression symptoms [45]. In a meta-analysis, it was reported that aerobic exercise was effective in individuals with anxiety and patients diagnosed with anxiety [46].

Even a small amount of physical activity has been shown to reduce the risk of chronic disease [47]. Individuals have been deprived of this therapeutic and protective effect of exercise during the quarantine. Especially individuals who used to exercise in gyms before the pandemic had difficulty maintaining these exercise habits. Unlike previous pandemics, the COVID-19 pandemic has coincided with the age of technology which has been an advantage. It has been shown that the use of digital platforms during this period has had a mediating role in supporting physical activity [48,49]. Therefore, some individuals could maintain their physical activity habits with the help of various exercise videos on the internet [33]. In addition, exercising by using virtual fitness platforms and exercise equipment in one's home increased physical activity during this period [48]. It was recommended to encourage home-based exercise so that participants continued to exercise while in quarantine using online communication. Following the lockdown period, many individuals, both with or without exercise habits became members of online exercise platforms. However, many of them were not able to sustain this activity. The sample of this study consists of individuals who regularly attended the gym. Norman et al. [50] reported that individuals who exercise regularly have a perception of an internal locus of control. Similarly, in this study, the majority of individuals (76.0%) who regularly attended the gym before the quarantine continued to exercise during the quarantine period. Additionally, it was determined that the majority of individuals (47.7%) exercised 3-4 days a week and more than half (70.0%) had an exercise duration of 1-2 hours. This shows that individuals had an exercise routine maintain these habits to a large extent even under psychological stress such as quarantine, which can be explained by the perception of locus of control of these individuals. The observed trend of a significant number of participants engaging in home-based exercise can potentially be attributed to the prevailing adoption of an internal locus of control among 74.9% of the participants.

The perspective of individuals' health locus of control is indicated by their belief in being protected from COVID-19 and/or their confidence in readily recovering from the condition. A perceived association exists between individuals' perception of health locus of control and their engagement in health improvement behaviours [51,52]. A recent study reported that individuals with the perception of internal locus of control exercise more in their spare time [15]. Since 76% of individuals in this study who regularly exercised before the pandemic also did so during quarantine,

it is not surprising that 74.9% of individuals also adopted an internal locus of control. It is possible to claimed that individuals who adopted the belief in internal locus of control persisted in their exercise routines throughout the quarantine duration.

In quarantine, increased emotional eating was predicted by higher anxiety, depression and quality of life, while the increase in binge eating was predicted by higher stress [53]. It has also been shown that difficulties in identifying emotions indirectly cause emotional eating through affective dysregulation [54]. In particular, individuals who tended to overeat before the quarantine and those with a higher BMI, may increase overeating during a psychologically challenging period such as the quarantine period [55]. A study showed that COVID-19 quarantine may be closely associated with emotional eating and weight gain, and participants with higher BMI exhibited more emotional eating behaviour [56]. In another study conducted during the quarantine period, it was found that individuals with higher BMI have lower physical activity levels, lower diet quality, and a higher frequency of overeating [57]. Similarly, the current study determined that obese (88.8±26.3) participants compared to underweight (64.5±19.4), normal weight (70.7±19.8) or overweight (76.7±22.7) participants, and overweight participants compared to normal weight participants exhibited more emotional eating behaviour. It can be suggested that a positive correlation exists between BMI and a tendency for engaging in emotional eating behaviour. The BMI offers as a physiological indicator of dietary patterns [58]. The present study posits that emotional eating may serve as a contributing factor to the increased BMI observed. This conclusion aligns with findings from previous investigations. Individuals who engage in emotional eating might exhibit increased predisposition towards emotional eating behaviours during the stressful period such as quarantine. In a study, it was found that emotional eaters who are quite physically active may feel the urge to eat when under emotional stress; however, they have been shown to be able to choose healthier foods to cope with this distress. Increasing physical activity may be a promising intervention strategy in preventing weight gain in emotional eaters by changing their food choice [59]. Since the face-to-face survey technique could not be used in this study, food consumption records could not be obtained. It is widely acknowledged that individuals who experience stress tend to exhibit a propensity for consuming foods rich in fat, sugar, and high in energy content [60]. However, since food consumption could not be recorded in this study, we could not record the contents of the consumed foods. Due to the unavailability of data on food consumption in this study, it was not possible to document the specific constituents of the consumed foods. Nevertheless, based on the existing literature, it can be inferred that individuals who engage in regular physical activity and have an internal locus of control tend to consume foods low in energy, fat, and sugar [61]. Konttinen et al. [20] reported a negative correlation between emotional eating and physical activity self-sufficiency. Similarly, in this study, emotional eating scale scores of individuals who continued to exercise (71.2±19.7) during the quarantine period were found to be statistically lower than those who did not exercise (79.9±25.0).

The socioeconomic disadvantage in developing countries has been strongly associated with a higher propensity for obesity. This study was conducted in a developing country. According to Spinoza, low socioeconomic level seems to affect BMI by increasing psychological distress and emotional eating [32]. This study found a negative relationship was found between higher economic status and emotional eating scores. Increased unemployment and decreased income during the pandemic period may have caused increased stress and anxiety. This, in turn, can trigger emotional eating.

A recently published study conducted during the COVID-19 period, it was reported that the frequency of emotional eating was higher in women [62]. A study conducted in Canada revealed that there was no significant alteration in individuals' body weight during the COVID-19 period. However,

adverse modifications in their dietary patterns were observed. According to latent class analysis, the group with a less healthy lifestyle reported that their body weight increased, their eating habits worsened, and their physical activity decreased [63]. Unhealthy eating habits have been associated with depression, body image dissatisfaction, and increased stress levels. Another study found that women had higher levels of stress, depression, and anxiety, and therefore higher food consumption [64]. Similarly, another study found that women exhibited more emotional eating behaviour than men and scored higher on depression and anger subscales than men [65]. In our research, although emotional eating scores were not generally very high; It was found that women's emotional eating scores were higher than men's. While the precise mechanisms remain unclear, emotional eating in reaction to negative affect may potentially function as a self-medication strategy for persons who are experiencing symptoms of depression. Understanding how disordered eating is triggered is key to this goal. For many people, food consumption is used to manage negative emotions. This argument carries particular significance in the context of women. Research has indicated that females exhibit a higher susceptibility, ranging from two to three times, to the development of anxiety and mood-related illnesses in comparison to males [66]. In addition, a number of other factors, such as gonadal hormones, environmental cues, rewarding properties of food, and cognitive control, may contribute to different risks for eating disorders between genders [67].

No difference was found between emotional eating scores according to age. It was found that participants under the age of 34 had a higher commitment to sports than participants aged 35 and over. Men's sports commitment was higher than women's when scores were compared. When the joint effect of age and gender on the scale scores was investigated, it was found that there was no effect. A study conducted in Turkey revealed no significant correlation between age and gender in individuals' commitment to sports [68]. In this study, the younger participants' better commitment to sports may be due to their better condition and health.

The belief in locus of control, which is the basis of the decisions people make, affects the health behaviours of participants such as regular exercise, healthy eating, moderate alcohol use and avoidance of smoking [12,69,70]. It has been determined that the eating function is affected by the perception of locus of control of individuals, that individuals with the perception of internal locus of control consume healthier foods, tend to make more effort to reach the correct information, and are more determined to maintain their diets [13,16,52]. Consistent with the literature, this study also determined that the participants adopting the perception of chance locus of control exhibited more emotional eating behaviour than those adopting the perception of internal locus of control. In addition, it was observed that the participants who adopted the perception of internal locus of control concerning their health behaviours had higher levels of sports engagement. The study revealed a positive correlation between internal locus of control and sports involvement, while a negative correlation was observed between internal locus of control and emotional eating, consistent with the expected results. Both the stress caused by the pandemic and having a perception of external locus of control can negatively affect activity and eating habits, which can lead to alarming levels of psychological distress. The perception of external locus of control in individuals exacerbates the relationship between pandemic-induced stress and general mental distress. In this respect, individuals who perceive of an external locus of control are particularly at risk [71]. In this study, it was seen that persons who had a perception of external locus of control exhibited greater levels of emotional eating compared to individuals who had internal locus of control perception. Additionally, it was shown that those with an external locus of control perception demonstrated lower levels of commitment to sports. Physical activity can potentially prevent the harmful cardiometabolic effects of physical inactivity and strengthen psychological aspects and coping skills. Therefore, it

is emphasized that doctors and other healthcare professionals can turn the COVID-19 quarantine process into an opportunity to provide physical activity counselling for their patients.

CONCLUSION

The COVID-19 pandemic, which has penetrated the world, has brought many physiological and psychological negativities. Especially, the quarantine interventions applied during the pandemic period have affected the lifestyle and social lives of individuals in particular nutrition and physical activity. Individuals with a perception of internal locus of control tried to maintain their pre-quarantine habits even during quarantine since they eat and exercised regularly. It has been observed that sports engagement also supports exercising in quarantine. It has been determined that individuals with a high BMI, who do not have a perception of internal health locus of control and who did not exercise during quarantine are prone to emotional eating. In the presence of a stressor such as the COVID-19 quarantine, supporting physical activity, outdoor exercising, as well as in-home exercising via online methods should be planned as a public health policy so that individuals do not lose their positive habits or those without these habits are less affected by the psychological effects. This study is important in determining a specific group's habits and behaviours during the quarantine. Moreover, to the best of our knowledge, this was the first study to evaluate exercise habits, perception of locus of control and emotional eating of individuals with exercise habits during the quarantine period. For future studies, we suggest an evaluation in terms of perception of health locus of control, sports engagement, motivation to sports, as well as stress and anxiety with a greater sample size, different age groups and ethnic groups. In the presence of physical impossibilities and psychological distress, factors other than the perception of locus of control that ensures sports engagement in individuals should also be studied.

One of the limitations of this study was having to conduct it through online platforms due to the COVID-19 pandemic. Another limitation was that anthropometric measurements and exercise habits (previous and current) were self-reported. In addition, the stress and anxiety states of individuals were not determined in this study.

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