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Evaluation of eating behavior disorders and Mediterranean diet adherence level during the Covid-19 pandemic period

Abstract

This research was planned and conducted as a descriptive research study in order to determine the effect of mood states during the COVID-19 pandemic process on eating behavior disorders and Mediterranean diet adherence in individuals and the relationship between these factors. The sample of the study consisted of individuals between the ages of 18-65 living in Turkey. This study was conducted on a total of 491(190 male, 301 female) individuals. The study data were obtained online through a form including questions about the sociodemographic information of individuals, Mediterranean Diet Adherence Scale (MEDAS), COVID-19 Fear Scale (FCV-19S), Three-Factor Eating Scale (TFEQ-R21), and nutritional habits The data obtained as a result of the study were evaluated with the Statistical Package for the Social Sciences (SPSS) 25.0 package program in the Windows environment and $p<0.05$ was considered significant in all calculations. A statistically significant correlation was found between the participants' FCV-19S and MEDAS and TFEQ-R21 ($p<0.05$). A significant correlation was found between the participants' TFEQ-R21 sub-dimension cognitive restriction and MEDAS and FCV-19S ($p<0.05$). A significant correlation was found between the participants' TFEQ-R21 sub-dimension emotional eating and FCV-19S ($p<0.05$). A significant inverse relationship was found between the participants' TFEQ-R21 sub-dimension, uncontrolled eating, and MEDAS ($p<0.05$). A significant correlation was found between the participants' TFEQ-R21 sub-dimension, uncontrolled eating, and FCV-19S ($p<0.05$). As a result, it was found that increased fear of COVID-19 in adults increased TFEQ-R21 total score, emotional eating, cognitive restriction and uncontrolled eating behavior levels, increased uncontrolled eating decreased MEDAS compliance, and increased cognitive restriction tended to increase MEDAS compliance. Increased FCV-19S was found to be associated with increased MEDAS. It is thought that interdisciplinary studies will be beneficial to reduce the level of fear felt by adults during the pandemic and to increase MEDAS levels by positively affecting their eating behaviors.

Keywords: Covid-19, mediterranean diet, eating behavior

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Introduction

Covid-19 is a health crisis that affects the whole world and needs to be addressed urgently.[1] In March, with the first case in Turkey, strict measures began to be implemented to control the spread of the Covid-19 virus, as in other countries.[2] While these measures helped reduce the infection rate, they caused a sudden and radical change in the habits of the population.[3] People who are used to social interaction have to keep their distance from their friends and family, they are suddenly left alone more or completely, their daily routines are interrupted due to restrictions, and constantly hearing or reading news about Covid-19 from the media has increased anxiety and stress.[4] People may turn to various eating behaviors to overcome negative feelings.[5] Emotional states can increase food intake and decrease it in some individuals.[6] One of the most important building blocks of health is nutrition. Nutritional therapy is of great importance in the treatment of various diseases, including many acute, chronic and infectious diseases. It has been observed that supportive nutrition therapy reduces the case fatality rate in the Ebola virus outbreak. The same situation is thought to be valid for SARS-CoV-2.[7] The most frequently mentioned diet type in the literature for protection against Covid-19 is the Mediterranean diet. Many authorities recommend increasing fruit and vegetable intake and reducing processed food intake during this period.[8] In processes that affect the life of the society, such as the current pandemic process, it is important to investigate the effects of the mood changes that occur during these processes on eating behavior and diet quality in order to enable the society to cope in a healthy way, to reduce the risk of secondary diseases and to take appropriate measures. This study aimed to determine the emotional states of adult individuals during the pandemic and to investigate the relationships between them and their eating behavior and Mediterranean diet adherence level.

Materials and methods

Type of research

This study was designed as a cross-sectional and descriptive study to determine the emotional states, eating behaviors and Mediterranean diet adherence of adults during the Covid-19 pandemic and to evaluate the relationship between them. Data was collected between October 1, 2021 and December 31, 2021.

Research population and sample

The population of the research consists of individuals in Turkey who are between the ages of 18-65, volunteer to participate in the research, are literate, and use at least one of the social networking sites and applications (Instagram, Facebook and WhatsApp). In the analysis conducted with the G*Power 3.1.9.4 program, when the

sample size was calculated with a margin of error of 0.05, power of 0.95 and effect size of 0.5, the minimum number of people to be included in the study was found to be 210.

Data collection tools

After the survey form, which included general introductory information, questions about nutritional status, Mediterranean Diet Adherence Scale, Three-Factor Eating Scale and COVID-19 Fear Scale, was created with "Google forms", the individuals were asked to use social networking sites and applications (Instagram, Facebook and Sent via WhatsApp) or e-mail. The general introductory information form is a section of eleven questions created by the researchers. The eating habits form, developed by researchers, is a four-question section that questions the number of snacks and main meals, skipping meals, and use of nutritional supplements during the pandemic. The Mediterranean Diet Adherence Scale was developed by Martinez-Gonzalez and colleagues in 2012.[9] Mediterranean Diet Adherence Scale is a survey consisting of 14 questions. Depending on the consumption amount, 1 or 0 points are received for each question asked, and the total score is calculated. A total score of 7 and above indicates that the individual has an acceptable degree of compliance with the Mediterranean diet, while a total score of 9 and above indicates that the individual has strict compliance with the Mediterranean diet. Mediterranean Diet Adherence Scoring (ADS) was taken from the Validity and Reliability study of the Turkish Adaptation of the Mediterranean Diet Adherence Scale.[10] In this study, the COVID-19 Fear Scale was used to determine the level of fear the participants felt during the Covid-19 pandemic period. FCV-19S is a unidimensional seven-item, five-point Likert scale developed by Ahorsu et al.[11] In this study, a three-factor eating scale form was used to evaluate the participants' eating behaviors. The original of this scale contains 51 items and consists of two parts. In the study conducted in Turkey by Baş et al.,[12] the Three-Factor Eating Scale consisting of 51 items was used. In addition, the 21-item form of this scale was adapted to Turkish culture by Karakuş et al.[13] This scale measures eating behavior with three sub-factors called cognitive restriction, uncontrolled eating and emotional eating.[13]

Results

A total of 491 adult individuals, 301 women and 190 men, aged 18-65, living in Turkey, participated in the research. The frequency distribution of socio-demographic characteristics is presented in Table 1.

Table 1 Frequency distribution table for socio-demographic characteristics

Variables		N	%
Gender	Woman	301	61.3
	Male	190	38.7
Marital status	Married	106	21.59
	Single	385	78.41
Educational Status	Middle school and below	16	3.26
	High school	70	14.26
	Licence	310	63.14
	postgraduate	95	19.35
Working Status	working	206	41.96
	Not working	285	58.04
Chronic Disorder	Yes	72	14.66
	No	419	85.34
BMI Classification	Weak	30	6.11
	Normal	302	61.51
	slightly fat	120	24.44
	Obese	39	7.94
Change in your body weight during the Covid-19 pandemic	There was an increase	220	44.81
	There was a decrease	77	15.68
	unchanged	170	34.62
	I don't know	24	4.89
Exercising at least 150 minutes a week before the Covid-19 pandemic	Yes	182	37.07
	No	309	62.93
Exercising at least 150 minutes a week during the Covid-19 pandemic	Yes	140	28.51
	No	351	71.49

N, number; %, percentage

According to the data in Table 1, 61.30% of the individuals participating in the study were female and 38.70% were male. It was reported that 21.59% of the adults participating in the study were married and 78.41% were single. It was determined that the education level of 3.26% of the participants was secondary school or below, 14.26% was high school, 63.14% was undergraduate and 19.35% was postgraduate. 41.96% of the participants stated that they were working, while 58.04% stated that they were not working. It was reported that 14.66% of the participants in the study had a chronic disease diagnosed by a doctor, and the remaining 85.34% did not have any chronic disease. According to BMI classification; It was determined that 6.11% of the individuals participating in the study were underweight, 61.51% were normal, 24.44% were slightly overweight and 7.94% were obese. It was reported that 44.81% of the participants increased in body weight during the pandemic, 15.68% reported a decrease in body weight, and 34.62% reported no change in body weight. It is seen that 37.07% of the participants in the study exercised before the pandemic, and 28.51% exercised during

the pandemic. While 62.93% of the participants stated that they did not exercise in the pre-pandemic period, 71.49% of the participants reported that they did not exercise during the pandemic.

According to the data in Table 2; There is no statistically significant difference between BMI statuses in terms of Mediterranean diet adherence levels (p>0.05). There is no statistically significant difference between BMI statuses in terms of Covid-19 fear levels (p>0.05). There is a statistically significant difference between BMI statuses in terms of three-factor eating levels (p<0.05). The three-factor eating levels of participants with underweight BMI classification are significantly lower than those of normal, slightly overweight and obese, and the three-factor eating levels of those with normal weight are significantly lower than those of those who are slightly overweight and obese. There is a statistically significant difference between BMI statuses in terms of cognitive limitation levels (p<0.05). Cognitive limitation levels of participants with underweight BMI classification are significantly lower than those of normal, slightly overweight and obese individuals, and cognitive limitation levels of those with normal weight are significantly lower than those of slightly overweight and obese individuals. There is a statistically significant difference between BMI states in terms of emotional eating levels (p<0.05). The emotional eating levels of those with underweight BMI classification are significantly lower than those of normal, slightly overweight and obese individuals, and the emotional eating levels of those with normal weight are significantly lower than those of slightly overweight and obese individuals. There is a statistically significant difference between BMI statuses in terms of uncontrolled eating levels (p<0.05). The uncontrolled eating levels of those in the underweight BMI category are significantly lower than those of normal, slightly overweight and obese, and the uncontrolled eating levels of those with normal weight are significantly lower than those of those who are slightly overweight and obese.

Table 2 Comparison of scales according to BMI classification

		BMI Categorical		Kruskal Wallis H Test		
		$\bar{X}$	ss	H	P.	Difference**
MEDAS	Weak	5.93	1.86	2,049	0.568	-
	Normal	6.33	1.83			
	slightly fat	6.11	1.96			
	Obese	6.13	1.89			
FCV-19S	Weak	15.3	7.73	4,894	0.18	-
	Normal	16.01	7.36			
	slightly fat	15.08	7.05			
	Obese	17.92	7.92			
TFEQ-R21	Weak	36.9	13.62	39,875	0.001*	1<2
	Normal	45.72	13.25			1<3
	slightly fat	50.12	11.83			1<4
	Obese	55.77	11.34			2<3
						2<4
Cognitive Restriction	Weak	10.37	4.6	23,059	0.001*	1<2
	Normal	14.05	4.96			1<3
	slightly fat	14.96	4.04			1<4
	Obese	14.15	4.3			2<3
						2<4
Emotional Eating	Weak	10.43	4.76	33,455	0.001*	1<2
	Normal	11.82	5.61			1<3
	slightly fat	13.28	6			1<4
	Obese	17.72	5.95			2<3
						2<4
Uncontrolled Eating	Weak	18.8	5.99	19,563	0.001*	1<2
	Normal	19.85	6.49			1<3
	slightly fat	21.88	6.52			1<4
	Obese	23.9	6.42			2<3
						2<4

$\bar{X}$, arithmetic mean; Ss, Standard deviation; *p<0.05

According to the data in Table 3; There is a statistically significant relationship with weak strength in the same direction between the level of fear of Covid-19 and the levels of adherence to the Mediterranean diet (r=0.116; p<0.05). As Covid-19 fear levels increase, Mediterranean diet adherence levels also increase. There is a weakly statistically significant correlation in the same direction between the Covid-19 fear level and the three-factor eating scale levels (r=0.336; p<0.05). As Covid-19 fear levels increase, three-factor eating scale levels also increase. There is a statistically significant relationship with weak strength in the same direction between cognitive restriction levels and Mediterranean diet adherence levels (r=0.125; p<0.05). As cognitive restriction levels increase, Mediterranean diet adherence scale levels also increase. There is a statistically significant relationship between cognitive restriction levels and Covid-19 fear levels, with weak strength in the same direction (r=0.208; p<0.05). As cognitive restriction levels increase, Covid-19 fear levels also increase. There is a statistically significant relationship between emotional eating levels and Covid-19 fear

levels, with weak strength in the same direction (r=0.250; p<0.05). As emotional eating levels increase, Covid-19 fear levels also increase. There is a statistically significant relationship with weak reverse power between uncontrolled eating levels and Mediterranean diet adherence levels (r=-0.139; p<0.05). As uncontrolled eating levels increase, Mediterranean diet adherence scale levels also decrease. There is a statistically significant relationship with weak strength in the same direction between uncontrolled eating levels and Covid-19 fear levels (r=0.317; p<0.05). As uncontrolled eating levels increase, Covid-19 fear levels also increase. There is no statistically significant relationship between other levels (p>0.05).

Table 3 Relationship between scale levels

		MEDAS	FCV-19S	TFEQ-R21	Cognitive Restriction	Emotional Eating	Uncontrolled Eating
MEDAS	r	1,000					
	p						
FCV-19S	r	0.116	1,000				
	p	0.01					
TFEQ-R21	r	-0.065	.336**	1,000			
	p	0.148	0.000*				
Cognitive Restriction	r	.125**	.208**	.543**	1,000		
	p	0.005*	0.000*	0.000*			
Emotional Eating	r	-0.084	.250**	.858**	.270**	1,000	
	p	0.062	0	0.000*	0.000*		
Uncontrolled Eating	r	-1.39**	.317**	.829**	.158**	.631**	1,000
	p	0.002*	0.000*	0.000*	0.000*	0.000*	

*p<0.05; **Correlation Coefficient.

Discussion

A study in the literature stated that emotional eating causes an increase in BMI and that emotional eating behavior prevents individuals from reaching their ideal BMI.[14] In another study, it was stated that the cognitive limitation levels of participants with normal body weight were significantly higher than participants with overweight.[15] It was reported that the TFEQ-R21 total score of the overweight and obese group was significantly higher. It has been reported that emotional eating and uncontrolled eating subscale eating behaviors increase as the BMI level increases.[16] In a study conducted on young adults in Italy, it was found that BMI levels increased as participants' emotional eating levels increased.[17] Individuals with slightly overweight and obese BMI groupings in situations of coping with negative emotions; It is reported that they are more likely to engage in overeating behavior than those who are underweight and have normal weight.[18] This study examined the three-factor eating, cognitive restriction, uncontrolled eating and emotional eating levels of participants who were underweight according to BMI classification; The three-factor eating levels of normal participants were significantly lower compared to normal, slightly overweight and obese participants; It was found to be significantly lower than the levels of those who were slightly overweight and obese (Table 2). According to the findings, in parallel with the literature, it is seen that emotional eating, uncontrolled eating and cognitive restriction levels increase as the BMI classification level increases. Therefore, it can be thought that irregularities in eating behaviors have a significant impact on the control of body weight, and that individuals' current BMI values also affect their eating behaviors.

In a study investigating the relationship between diet quality during the pandemic in our country and anxiety due to Covid-19, it was reported that no difference was observed between fear scale scoring and Mediterranean diet compliance.[19] In a study conducted on adults in which the level of pandemic fear and the compliance with the Mediterranean diet were evaluated, it was stated that the food selection of individuals differed according to their level of fear, and the compliance level of participants with low fear levels to the Mediterranean diet was higher than the Mediterranean diet compliance scores of participants with high and medium levels of fear. reported to be at a low level. But; It has been stated that there is no significant relationship between individuals' Covid-19 fear level and their adherence to the Mediterranean diet.[20] In this study, it was determined that as the Covid-19 fear levels of the participants increased, the Mediterranean diet adherence levels also increased (Table 3). It can be thought that the fear of catching the virus felt by individuals during the pandemic period is effective in turning to a healthier and more balanced diet in order to strengthen the immune system.

According to a study conducted on healthcare workers, an increase in TFEQ-R18 scoring was found to reduce stress and fear levels; stated that the levels of fear felt negatively affect eating behaviors.[21] It has been found that negative emotions significantly affect the level of emotional eating behavior on adult individuals through the fear of Covid-19.[22] In this study, it was found that as the participants' Covid-19 fear level increased, the total score of the three-factor eating scale and the scale sub-dimensions of cognitive restriction, emotional eating and uncontrolled eating also increased (Table 3). Literature research shows that during anxious and stressful periods such as fear, individuals try to control their emotions by turning to nutrition. For this reason, it is thought that fear of Covid-19 will trigger disorders in eating behaviors.

In a study; In the study on mood, nutritional behaviors and diet quality, nutritional plans with high compliance with the Mediterranean diet were applied to overweight and obese male individuals with metabolic syndrome for 12 months, and an evaluation was made at the end of the study with the group without any intervention. It was reported that while there was a decrease in emotional and uncontrolled eating behavior of the intervention group, there was an increase in cognitive restrictive eating behavior. Although it was reported that there was no change in the participants' body weight as a result of the intervention, their compliance with the Mediterranean diet increased.[23] In this study, it was determined that when cognitive restriction, one of the sub-dimensions of eating behaviors, increases, the level of compliance with the Mediterranean diet also increases (Table 3). Additionally, it was found that the level of adherence to the Mediterranean diet decreased as the level of uncontrolled eating

behavior increased (Table 3). In this context, it is thought that incentives and studies to increase adherence to the Mediterranean diet in society will positively affect eating behaviors.

Conclusion

As Covid-19 fear levels increase, Mediterranean diet adherence and three-factor eating behavior levels also increase. It has been found that as cognitive restriction eating behavior levels increase, Mediterranean diet adherence and Covid-19 fear levels also increase. As emotional eating levels increase, Covid-19 fear levels increase. It has been found that as uncontrolled eating levels increase, Mediterranean diet adherence scale levels decrease, while Covid-19 fear levels increase. Three-factor eating, cognitive restriction, uncontrolled eating and emotional eating levels of those with a poor BMI degree; Three-factor eating levels of those with normal weight are significantly lower than those of normal, slightly overweight and obese; It was found to be significantly lower than the levels of those who were slightly overweight and obese.

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None.

Conflicts of interest

Authors declare that there is no conflict of interest.

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