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EVALUATION OF BODY MASS INDEX CHANGES, NUTRITIONAL HABITS AND FOOD LITERACY LEVELS OF INDIVIDUALS RECEIVING NUTRITION AND DIETARY COUNSELING DURING THE COVID-19 LOCKDOWN PERIOD; ANKARA, PURSAKLAR

Beslenme ve Diyet Danışmanlığı Alan Bireylerin COVID-19 Kısıtlama Sürecindeki Beden Kitle İndeksi Değişimleri, Beslenme Alışkanlıkları ve Gıda Okuryazarlığı Düzeylerinin İncelenmesi; Ankara, Pursaklar

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ABSTRACT

Objectives: In this study, it was aimed to evaluate the BMI values, changes in nutritional habits and food literacy levels of individuals who had previously received nutrition and diet counseling during the COVID-19 restriction process. **Method:** The study was cross-sectional and was conducted with 44 individuals over the age of 18 who received nutrition and diet counseling at Pursaklar District Health Directorate. After the individuals were called by phone and their verbal consent was obtained, they were directed to a questionnaire consisting of questions about sociodemographic characteristics, anthropometric data, nutrition and lifestyle habits, and the short food literacy questionnaire. **Results:** The mean age of the participants was 40.20±9.08 years and 93.2% were women. The mean BMI of the participants was 33.87±6.36 before the restriction period and 32.84±5.87 after the restriction period. During the restriction period, 47.7% of the participants reported that their eating habits worsened and 36.4% reported that their appetite increased. 22.7% of the group stated that they skipped main meals during the period, while 20.5% added to main and snacks. The mean food literacy scale score of the participants was 33.54±5.8. As the education level of the participants increased, the food literacy score increased. **Discussion:** Individuals' exercise, screen time and eating habits were negatively affected during the COVID-19 restriction process.

Keywords: COVID-19, Eating Habits, Food Literacy

ÖZET

Amaç: Bu çalışmada, daha önce beslenme ve diyet danışmanlığı alan bireylerin, COVID-19 kısıtlama sürecinde BKİ değerleri, beslenme alışkanlıkları değişiklikleri ve gıda okuryazarlığı düzeylerinin incelenmesi amaçlanmıştır. **Yöntem:** Araştırma kesitsel tipte olup çalışma, Pursaklar İlçe Sağlık Müdürlüğü'nde beslenme ve diyet danışmanlığı alan 18 yaş üzeri 44 kişi ile yürütüldü. Bireyler telefonla aranarak sözlü onamlarının alınması sonrasında sosyodemografik özellikler, antropometrik veriler, beslenme ve yaşam tarzı alışkanlıkları ile ilgili sorulardan ve gıda okuryazarlığı ölçeğinden oluşan anket soruları yönlendirildi. **Bulgular:** Katılımcıların yaş ortalaması 40,20±9,08 yıl olup %93,2'sini kadınlar oluşturdu. Katılımcıların kısıtlama sürecinden önce BKİ değerleri ortalaması 33,87±6,36 iken süreç sonunda 32,84±5,87 olduğu izlendi. Kısıtlama döneminde katılımcıların %47,7'si yeme alışkanlığının kötüleştiğini ve %36,4'ü iştahının arttığını bildirdi. Grubun %22,7'si süreçte ana öğünleri atladığını, %20,5'i ise ana ve ara öğünlere ekleme yaptığını ifade etti. Katılımcıların gıda okuryazarlığı ölçek puan ortalamaları 33,54±5,8 bulunmuştur. Katılımcıların eğitim düzeyi artıkça gıda okuryazarlığı puanı yükselmiştir. **Sonuç:** Bireylerin, COVID-19 kısıtlama sürecinde egzersiz yapmaları, ekran kullanım süreleri ve yeme alışkanlıkları olumsuz etkilenmiştir.

Anahtar Kelimeler: Beslenme Alışkanlıkları, COVID-19, Gıda Okuryazarlığı

INTRODUCTION

The first Coronavirus disease 2019 (COVID-19) case was detected in Turkey on March 11, 2020. In the period since the first case was detected, it has been aimed to gradually reduce the effects of the outbreak and limit the outbreak with public health measures (T.C. Sağlık Bakanlığı, 2020). For this purpose, the activities of public places of rest and entertainment were suspended, flexible working arrangements in public institutions, entry-exit bans in cities where cases are frequently seen, and curfew interventions on weekends have limited the spread of COVID-19 (T.C. İçişleri Bakanlığı, 2020a, 2020b). The COVID-19 pandemic has affected daily life worldwide with its physical and mental health effects (Holmes et al., 2020). Stress is an important factor in the development and re-emergence of addiction and is known to affect eating patterns in general (Yau & Potenza, 2013). The interruption of work routine caused by quarantine may lead to boredom, and it has been shown that there are significant positive associations between boredom and calorie, fat, carbohydrate and protein consumption and the desire to eat less healthy foods (Moynihan et al., 2015). During this period, people's consumption of unhealthy foods and snacking between meals increased (Carroll et al., 2020). Isolation appears to change physical activity and eating behaviors in a way that is risky for health (Ammar et al., 2020). In the face of the current COVID-19 pandemic, there have been restrictions to reduce the infection rate with public health recommendations. These restrictions cause negative effects by limiting access to normal daily and physical activity (Hossain et al., 2020). The quarantine itself and its negative psychological effects can lead to unhealthy behaviors such as physical inactivity, increase in sedentary lifestyle, consumption of unhealthy food and beverages, and changes in proper dietary patterns (López-Bueno et al., 2020). In this study, it was aimed to examine the body mass index (BMI) values, eating habits, lifestyle changes and food literacy levels of individuals who received nutrition and diet counseling during the COVID-19 restriction process.

METHODS

The study was cross-sectional. The population of the study consisted of people who applied for nutrition and diet counseling in Ankara Pursaklar District Health Directorate between 2019 and 2020. In this study, it was aimed to reach the entire population, but the study was conducted on 44 adults over the age of 18 who agreed to participate in the study. After obtaining the necessary ethical and institutional permissions, the study was conducted by the researcher between March 29, 2021, and July 5, 2021, by calling the phone numbers provided by individuals during registration. Participants were informed about the study and verbal consent was obtained by asking them to accept the data sharing and confidentiality policy before participating in the study. Survey questions were directed to the individuals who agreed to participate in the study and data were obtained. The questionnaire consisted of 4 sections including sociodemographic characteristics (gender, age, marital status, education, employment status, income level), anthropometric data (height, weight), questions about nutrition and lifestyle habits (hunger/satiety perception, weight change, number of daily meals, screen time, sleep duration, water consumption, exercise) and food literacy scale. The food literacy section of the questionnaire was taken from the literature. The Short Food Literacy Questionnaire - SFLQ is a scale developed by Krause et al. (Gréa Krause et al., 2018). This scale, which covers important elements of nutritional literacy and definitions of food literacy, has a four- or five-point Likert-type 12-item questionnaire. A score ranging from 7 to 52 can be obtained from the scale. A higher score indicates better food literacy. The Turkish validity and reliability of the SFLQ scale was conducted by Durmuş et al. in 2019 (Durmus et al., 2019). Ethics committee approval and necessary institutional permissions were obtained from Ankara Yıldırım Beyazıt University Health Sciences Ethics Committee (date: 16/02/2021, no: 64). No financial support was received for the conduct of the study and there was no conflict of interest. IBM SPSS 24.0 package program was used for data analysis. Number (n), percentage (%), mean ± standard deviation

(SD), median, minimum (min), maximum (max) were used for descriptive statistics. Chi-square test was used to compare categorical data. Chi-square (Mc-Nemar) test was used for categorical data in dependent groups, paired t test was used for normally distributed continuous data, and Wilcoxon test was used for non-normally distributed data to evaluate the changes before and after COVID-19 quarantine. In the comparison of continuous data, one-way Anova test and independent t test were used since they were compatible with normal distribution. $p \leq 0.05$ was accepted for statistical significance.

RESULTS

The study included 44 participants. 93.2% of the participants were women. The mean age of the participants was 40.20±9.08 years (min 21-max 62). 88.6% of the participants were married. 47.7% of the participants were primary school graduates, 25% were high school graduates and 27.3% were university graduates. 31.8% of the participants were employed and 29.5% had an income level of minimum wage or less (Table 1).

Table 1: Sociodemographic Characteristics of Participants

		n=44	%
Gender	Female	41	93.2
	Male	3	6.8
Marital Status	Married	39	88.6
	Single	5	11.4
Education	Primary school	21	47.7
	High school	11	25.0
	University	12	27.3
Age Groups	18-30	8	18.2
	31-40	14	31.8
	41-50	16	36.4
	51 years and older	6	13.6
Employment Status	Unemployed	30	68.2
	Employed	14	31.8
Income Level (Turkish Lira)	3500 and lower	13	29.5
	3501-7000	18	40.9
	7001 and higher	6	13.7
	Not specified	7	15.9

When the change in eating habits of the participants were analyzed, 47.7% stated that it worsened during this period, while 40.9% stated that there was no change. 36.4% of the participants reported that their appetite increased during this period. In this period, 20.5% of the group added to main and intermediate meals, while 52.3% stated that they did not change the number of meals (Table 2). 11.4% of the participants reported that their consumption of products and 27.3% of bread and pastries increased during this period. There was no significant difference in smoking before and after the restriction ($p>0.05$). Change in eating habits, number of daily feedings, change in feeling of hunger and fullness, and weight gain did not differ according to gender, lifestyle, education, marital status and profession ($p>0.05$).

Table 2: Nutrition and Behavioral Changes in Covid-19 Quarantine

		n=44	%
Eating Habit Change	It didn't change	18	40.9
	It got worse	21	47.7
	It got better	5	11.4
Hunger/Satiety Perception	It didn't change	24	54.5
	It decreased	4	9.1
	It increased	16	36.4
Weight Change	I think my weight is stable	12	27.3
	I think I lost weight	7	15.9
	I think I gained a little weight	10	22.7
	I think I gained too much weight	15	34.1
Water Consumption	It didn't change	28	63.6
	It increased	15	34.1
	It decreased	1	2.3
Screen Time Change	It didn't change	12	27.3
	It increased	29	65.9
	It decreased	3	6.8
Number of Daily Meals	It didn't change	23	52.3
	I skipped the main meals	10	22.7
	I added extra main and snack meals	9	20.5
	Not specified	2	4.5

Before and during the restriction period, 38.6% and 65.9% of the individuals reported that they did not do any sports. It was observed that participants reduced their exercise during the restriction period (p = 0.012) (Table 3). Of the supplement, 65.9% reported an increase in screen use time. 27.3% of the participants reported that their weight remained stable, 15.9% reported weight loss, 22.7% stated that they thought they gained a little weight, and 34.1% thought they gained too much weight.

Table 3: Comparison of Participants' Physical Activity Before and During COVID-19

		before-COVID-19		during COVID-19		
		n=44	%	n=44	%	p
Physical Activity	No	17	38,6	29	65,9	**0.012***
	Yes	27	61.4	15	34,1	

*Mcnemar, p <0.05

The mean BMI values of the participants were 33.87±6.36 before the restriction process and 32.84±5.87 during the process (p=0.013) (Table 4). However, 56.8% of the participants reported that they gained weight during this period.

Table 4: Comparison of Mean BMI Values of Participants Before and During COVID-19

	before-COVID-19 (mean±sd)	during COVID-19 (mean±sd)	p
BMI	33.87±6.36	32.84±5.87	**0.013***

*Paired t test, p <0.05

In the same period, 34.1% of the participants reported that increased water consumption during this period. Participants reported an increase in sleep duration during the restriction period, but analyses showed that sleep duration did not change before and after the restriction (p = 0.078). The participants' food literacy questionnaire mean score was found to be 33.54±5.8 (Min 20-Max 45). There was no statistically significant difference in knowledge level in terms of gender and marital status (p>0.05). The mean food literacy score of women was 33.63±5.95 and was higher than the mean of men, 32.33±3.71. The average food literacy score of working participants was 35.64±4.48, while that of non-working participants was 32.56±6.15. Food literacy level did not differ significantly according to employment status and income level (p>0.05) (Table 5). Considering the food literacy average score in terms of educational status, the score of primary school graduates was calculated as 30.73±5.99, high school graduates as 35.00±4.18, and university graduate participants as 37.13±4.4. As the education level of the participants increased, the food literacy score increased (p = 0.04). The average food literacy score of the participants according to their body mass index is 35.06±3.16 for normal weight participants, 37.32±6.14 for overweight participants, 32.00±5.31 for obese participants, and there was a significant difference between the groups (p=0.027) (Table 5). In our study, achieved power (1-B) was determined as 80.1% in the post-hoc power analysis performed with 0.05 alpha error, 44 minimum sample size, and 3.07 odd ratio value.

Table 5: Comparison of The Short Food Literacy Questionnaire- SFLQ

		Mean±SD	p
Gender	Female	33.63±5.95	0.71[1]
	Male	32.33±3.71	
Working Status	Employed	35.64±4.48	0.10[1]
	Unemployed	32.56±6.15	
Marital Status	Single	33.68±3.79	0.96[1]
	Married	33.52±6.05	
Age Groups	18-30	37.35±4.51	0.23[2]
	31-40	33.04±6.15	
	41-50	32.28±6.09	
	51 years and older	33.00±4.72	
Education	Primary school	30.73±5.99*	**0.04[2]**
	High school	35.00±4,18	
	University	37.13±4.40*	
BMI	Normal weight	35.06±3.16	**0.03[2]**
	Overweight	37.32±6.14*	
	Obesity	32.00±5.31*	

[1]Independent t test, [2]One-way ANOVA, *post hoc tukey, p <0.05

DISCUSSION

COVID-19 has caused a global pandemic. Governments have imposed restrictions and mass quarantines to control the spread of the COVID-19 virus. Lockdowns and restrictions have led to lifestyle changes, such as reduced physical activity and unhealthy diets (Mattioli et al., 2020). Quarantine potentially causes weight changes due to dietary changes, lack of physical activity, and stress. In a study conducted in Poland, 29.9% of the participants reported weight gain and 18.6% reported a decrease in weight (Sidor & Rzymski, 2020). Similarly, in our study, 27.3% of our participants stated that their weight remained constant, 15.9% lost weight, 22.7% gained a little weight, and 34.1% stated that they

gained a lot of weight. In another study conducted on the Spanish population, 52.7% of the participants reported weight gain during quarantine and 47.3% reported that their weight did not change (Sánchez-Sánchez et al., 2020). An international study shows that COVID-19 isolation and house arrest have a negative impact on physical activity and nutrition (Ammar et al., 2020). In a study conducted in the United States, 37% of the participants stated that there was no change in their general diet, and 31% stated that their diet had worsened (Khubchandani et al., 2020). In a study conducted in Australia, 34.6% of participants reported an increase in overeating behaviors compared to before COVID-19 (Phillipou et al., 2020). In our study, 47.7% of our participants stated that their eating habits worsened during this period, 22.7% skipped main meals during the process, and 20.5% stated that they added extra meals. A study conducted in Italy stated that boredom was the cause of changes in eating behaviors (Pellegrini et al., 2020). Our study concluded that our participants reduced their exercise during the restriction period. In a study conducted in the United Kingdom, 40% of individuals reported exercising less during quarantine (Robinson et al., 2021). Despite recommendations that house arrest should not prevent people from being physically active, current results have shown a decrease in all levels of physical activity during the COVID-19 house arrest period (Ammar et al., 2020). It is known that overweight and obese groups exhibit more problematic eating behaviors, including food consumption without hunger and frequent overeating (Opichka et al., 2019). One study found that binge eating during the pandemic was 2.88 times higher in people experiencing weight stigma (Puhl et al., 2020). Increased rates of stress and negative effects due to the pandemic and social isolation may contribute to the increased risk of eating disorders (Rodgers et al., 2020). In a study conducted in Italy, 34.4% of participants stated that their appetite increased during the COVID-19 quarantine (Di Renzo et al., 2020). In another study conducted in Italy, 46.1% of participants reported eating more during quarantine and 19.5% reported gaining weight. An increase in the consumption of "comfort food", especially chocolate, sweets and salty snacks, has been reported (Scarmozzino & Visioli, 2020). In another study conducted in Poland, 51.8% of participants reported increased snacking during quarantine (Sidor & Rzymski, 2020). Our findings were consistent with these results. 36.4% of our participants stated that their appetite increased during this period. Additionally, 11.4% reported that their consumption of snack products and 27.3% of bread and pastries increased during this period. People with high nutritional literacy tend to exhibit healthy eating behaviors (C. K. Lee et al., 2019). In our study, women paid more attention to nutritional characteristics than men and scored higher on the SFLQ. Our results were consistent with the study conducted in Italy (Trieste et al., 2021). In a study conducted in South Korea, female participants scored higher than men in terms of endurance levels in food literacy (Y. Lee et al., 2022). In another study on adults, higher levels of food literacy were associated with greater self-control, less impulsivity, and healthier food consumption (Poelman et al., 2018). Consistent with the data obtained from Italy (Palumbo et al., 2019), the food literacy score increased as the education level of the participants in our study increased. In a study conducted during the COVID-19 quarantine, unhealthy eating patterns were reported more frequently by overweight and obese people than those of normal weight during the COVID-19 pandemic (Poelman et al., 2021). Supporting this, in our study, the food literacy scores of obese participants were lower than those of overweight and normal weight participants. People with obesity should be given more attention in nutrition and dietary counseling. This study has some limitations. Data were collected by telephone interview. Since people's BMI measurements are not measured directly after the restriction, they are based on people's statements. Limited generalizations can be made due to the low number of participants and male participation.

CONCLUSION

This study shows that during the COVID-19 restriction period, individuals may experience changes in their eating habits, manifested by exercise, screen use, eating more and weight change, and are negatively affected by important health behaviors. Research is needed to understand the negative effects of COVID-19-related quarantine on eating

habits and health and to prevent its negative effects on public health.

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