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The impact of COVID-19 anxiety on eating disorders in medical and Master's students

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Abstract. – OBJECTIVE: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2 virus) first appeared in China with rapidly progressing pneumonia of unknown cause. Our goal was to investigate the relationship between COVID-19 anxiety and eating disorders among front-line physicians during the COVID-19 pandemic.

SUBJECTS AND METHODS: This study is observational, prospective and analytical. The study population age range is from 18 to 65 years and includes healthcare professionals with a Master's degree or higher or subjects who have completed their education. We administered the Demographic Data Form, the Eating Disorder Rating Scale (EDRS), and the Coronavirus Anxiety Scale (CAS) to "Health professionals with a Master's degree or higher education, or who are receiving or have received Medical Specialization Training" across Turkey.

RESULTS: The study initially included 312 people in total, but 19 were excluded (9 due to a pre-existing eating disorder, 2 for pregnancy, 2 for colitis, 4 for Diabetes Mellitus, 1 for depression, 1 with generalized anxiety disorder – GAD), leaving 293 subjects (82 men and 211 women). Assistant doctor was the highest status in the study group (56%), while specialization Training was the highest level of training (60.1%).

CONCLUSIONS: We presented a detailed account of effects of scales and parameters related to the COVID-19 process on eating disorders and weight change in a specific population. These effects show both anxiety scores related to COVID-19 and eating disorders on various aspects and identify various variables influencing these scales in the main groups and subgroups.

Key Words:
COVID-19, Eating disorders, Anxiety, Healthcare workers.

Introduction

Throughout history, numerous epidemics have harmed human health and resulted in widespread death. One of these was severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2 virus), which first appeared in China in December 2019 with an increase in cases of acute, rapidly progressing pneumonia of unknown cause[1]. The new type of coronavirus disease (COVID-19) was detected, and it quickly became a global epidemic. In March 2020, the World Health Organization (WHO) declared SARS-CoV-2 a pandemic[1,2].

Due to the rapidly spreading of SARS-CoV-2, all countries' health systems have faced challenges in identifying and managing COVID-19 cases, of which no prior knowledge existed, and in providing effective strategies to protect public health[2-4]. The COVID-19 pandemic has caused social, physical, economic, and psychological problems worldwide. These difficulties include intense psychological reactions, such as anxiety, stress, fear, confusion, and increased irritability, as well as difficulties in maintaining consistency in treatments[5-7]. Although this effect was seen at all levels of society, physicians and health workers providing vital health services on the front lines were undoubtedly among the most affected[6]. Issues included lack of knowledge about the characteristics of SARS-CoV-2; deficiencies in protective personal equipment (particularly in the early stages of the epidemic); shortages of healthcare professionals, physician, and personnel; increased workload; insufficient hospital and medical equipment shortages; and issues associated with the nature of the profession itself. Psychological difficulties were increased by the high incidence of COVID-19 disease among healthcare workers in the early stages due to frequent viral exposure and increased viral load[2,3]. In addition to the direct effects of the pandemic, physicians and healthcare professionals faced secondary traumatic stress while caring for COVID-19

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patients. Secondary traumatic stress is defined as the exposure of those who are indirectly affected by, for example, assisting victims or treating traumatized patients[7]. An evaluation of many articles[8-11] published during the COVID-19 epidemic revealed higher anxiety levels of physicians and healthcare workers compared to those of other segments of society[8], who have been discovered to frequently suffer from post-traumatic stress disorder, secondary stress disorder, alcohol abuse, major depression, and generalized anxiety disorder[8-11]. The following have all been identified as causes of anxiety in physicians and healthcare workers: the fear of transmitting a virus to their families, extended working hours, fear of contracting COVID-19, lack of protective equipment, absence from their families, lack of time to see relatives, and exclusion/stigma. Women were found to have higher levels of anxiety[9,11,12]. There was concern that the pandemic's negative emotional effects, as well as preventative measures, such as quarantine, could exacerbate eating disorder (ED) triggers and symptoms due to increased symptoms of depression and anxiety[13]. Emotional eating is thought to provide reassurance and comfort, rather than distraction[14-16]. According to a 2001 study[17], eating was found to help people feeling better when unhappy[16]. An increase in food intake in response to negative emotional stimuli was referred to as "emotional eating" and regarded as an inappropriate reaction. The researchers have emphasized that this overeating response observed to face negative emotions is present not only in obese individuals, but also in women with ED and in people of normal weight who are on a diet[18-20]. It has been suggested[18,20] that most emotional eating is a result of inappropriate coping strategies; eating is a way for people with this behavior pattern to avoid or cope with negative emotions.

Based on the literature, our goal was to investigate the relationship between COVID-19 anxiety and eating disorders among front-line physicians during the COVID-19 pandemic.

Subjects and Methods

Characteristics of the Study and Data Collection Tools

This study was observational, prospective, and analytical. The study population ranged from 18 to 65 years old and includes "healthcare professionals with a Master's degree or higher, or who have completed their education". We administered the Demographic Data Form, the Eating Disorder Rating Scale (EDRS), and the Coronavirus Anxiety Scale (CAS) to "Health professionals with a Master's degree or higher education, or who are receiving or have received Medical Specialization Training" across Turkey. The demographic data form elicited data on marital status, age, occupation/status, current educational status, COVID-19 diagnosis status, height, weight, faculty graduation time, smoking status, chronic illness, and having worked in the COVID-19 polyclinic and/or service.

The Eating Disorders Examination Questionnaire is also known as the Eating Disorder Assessment Questionnaire (EDE-Q), adopted by Fairburn and Beglin (1994). The 28-question scale is divided into five subscales: Restriction (R), Binge Eating (BE), Body Shape Concerns (SC), Eating Concerns (EC), and Weight Concerns (WC). The subscales' scores, with the exception of the Binge Eating subscale, range from 0 to 6, with higher scores indicating the presence of the pathology. The total score is calculated by adding the subscale scores, excluding the Binge Eating subscale[21-23]. Yücel et al[23] conducted a Turkish validity and reliability study in a sample group of adolescents. The scale's internal consistency coefficient was determined to be 0.93, while the test-retest reliability was 0.91[16].

The CAS scale is a 5-items scale that determines the anxiety state associated with COVID-19 and scored on a Likert scale ranging from 0 to 4. The coronavirus anxiety scale (CAS) is a self-reported mental health screening tool for coronavirus-related dysfunctional anxiety. The CAS was created to allow clinicians and researchers to investigate the levels of clinically significant fear and anxiety during an infectious disease epidemic. Independent studies[24-27] showed it to be a reliable scale with robust factorial (single factor; invariance across sociodemographic) and structural (correlated with anxiety, depression, suicidal ideation, and coping with substance/alcohol) validity (> 0.90). CAS diagnostic properties (90% sensitivity and 85% specificity) are comparable to those of related screening tools like General Anxiety Disorder-7. Based on experiences over two weeks, each CAS item was rated on a 5-point scale ranging from 0 (never) to 4 (almost every day). This scaling pattern is consistent with the DSM-5 cross-symptom scale. A CAS total score of 9 indicates coronavirus-related dysfunctional anxiety. High scores on a specific item

or a high overall scale score ≥ 9 may indicate that the individual has problematic symptoms that require further evaluation and/or treatment. Clinical judgement should be used to interpret CAS results[18,26,27].

Inclusion and Exclusion Criteria for Research

Prerequisites were: being a healthcare professional (doctor, nurse, physiotherapist, etc.), having a Master's degree or higher, and agreeing to participate in the research.

Exclusion criteria: having conditions that may interfere with the research, such as a chronic disease (gastrointestinal problems such as eating disorder, pregnancy, colitis affecting eating, diagnosed psychiatric disease, Diabetes Mellitus, etc.).

Methods of Data Collection and Sampling

Participants volunteered to participate in the study. The G*Power program (version 3.1) was used to perform sample size analysis based on the research hypothesis and analysis method, and the sample size was determined to be 272 + 27 = 299. "Sequential sampling" was used to collect data (i.e., each volunteer was recruited sequentially).

We used a data collection form called demographic data collection form, EDRS (Eating Disorder Rating Scale) and questionnaire form consisting of CAS. Informed consent in this scale form includes the following information: marital status, age, occupation/status, current educational status, COVID-19 diagnosis status, height, weight, duration of faculty graduation, smoking status, chronic illness, employment in any COVID-19 unit, and eating disorder diagnosis (exclusion criterion). Demographic features were added to these. After obtaining informed consent from the participants, the data were collected using a Google survey and the sequential data collection.

The Research Hypotheses

Our hypotheses for the research are as follows:

1. Does COVID-19 anxiety status have no effects on eating disorder scores?
2. Does having COVID-19 have no effect on eating disorder scores?
3. Does working in the COVID-19 unit have no effects on eating disorder scores?

Statistical Analysis

Combined effects of Coronavirus Anxiety Scale, being diagnosed with COVID-19, working in the COVID-19 unit, and other numerical (age, etc.) and categorical variables (gender, etc.) on the dependent variable (EDRS) were analyzed by ANCOVA general linear model. We aimed at observing the combined and marginally significant effects of independent variables.

More detailed interrelations of the numerical variables were found to be significant in the ANCOVA model using the "Correlation" and "Linear Regression" methods. Using the "Correlation" and "Linear Regression" methods, more detailed effects of the numerical variables were found to be significant in the ANCOVA model for each other.

The effects of the categorical variables were found to be significant in the model, as well as their relationship to the EDRS scores. This analysis was conducted using the "Comparison of Means in Independent Groups" method. *p*-values lower than 0.05 were considered statistically significant.

Results

Descriptive Results

General demographic results

The study initially included 312 people in total, but 19 were excluded (9 due to a pre-existing eating disorder, 2 for pregnancy, 2 for colitis, 4 for Diabetes Mellitus, 1 for depression, 1 with generalized anxiety disorder – GAD), leaving 293 subjects (82 men and 211 women). Assistant doctor was the highest status in the study group (56%), while Specialization Training was the highest level of training (60.1%). Table I summarizes the study group's general demographic findings.

Descriptive features according to the COVID-19 diagnosis of the working group

BMI was higher in those diagnosed with COVID-19 and was more pronounced in women. The rate of patients with chronic disease (21.1%) was also higher in the diagnosed with COVID-19 group. Table II shows the characteristics of the study group according to the COVID-19 diagnosis status.

Scale scores based on the group's COVID-19 diagnosis

Those diagnosed with COVID-19 had higher EDRS scores. This was more apparent in EDRS-Restriction, EDRS-General, and women's

Table I. General group characteristics.

	Male		Female		Total		
	n:	Mean±SD. (%)	n:	Mean±SD. (%)	n:	Ort±SD. (%)	p
Marital Status							
Single	43	(52.4)	104	(49.3)	147	(50.0)	
Married	39	(47.6)	107	(50.7)	146	(50.0)	.723
Total	82	(100.0)	211	(100.0)	293	(100.0)	
Average Age							
Single	43	27.98 ± 3.80	104	27.62 ± 4.38	147	27.72 ± 4.21	.638
Married	39	33.00 ± 6.30	107	34.26 ± 6.51	146	33.92 ± 6.46	.298
Total	82	30.37 ± 5.76	211	30.99 ± 6.47	293	30.81 ± 6.26	.448
Occupation/Status							
Assistant Doctor/Trainee	62	(68.3)	114	(51.2)	176	(56.0)	
Speech therapist	0	(0.0)	1	(0.5)	1	(0.3)	
Dietician	0	(0.0)	7	(3.3)	7	(2.4	
Medical Doctor	0	(0.0)	3	(1.4)	3	(1.0)	
Pharmacist	0	(0.0)	1	(0.5)	1	(0.3)	
Physiotherapist	1	(1.2)	1	(0.5)	2	(0.7)	085
Nurse	2	(2.4)	13	(6.2)	15	(5.1)	
Audiologist	0	(0.0)	1	(0.5)	1	(0.3)	
Specialist Doctor	14	(17.1)	62	(29.4)	76	(25.9)	
Fellowship Trainee	3	(3.7)	8	(3.8)	11	(3.8)	
Total	82	(100.0)	211	(100.0)	293	(100.0)	
Educational status							
PhD	1	(1.2)	11	(5.2)	12	(4.1)	
Trainee	62	(75.6)	114	(54.0)	176	(60.1)	
Graduated	13	(15.9)	56	(26.5)	69	(23.5)	
Master's Degree	3	(3.7)	22	(10.4)	25	(8.5)	012
	3	(3.7)	8	(3.8)	11	(3.8)	
Total	82	(100.0)	211	(100.0)	293	(100.0)	

scores. Table III shows the characteristics of the Scale Scores based on the group's COVID-19 diagnosis status.

Scales-Related Findings

The overall CAS average score was 1.35. In general, the mean score in the restriction sub-dimension was 1.24 out of 6. In general, in the binge-eating sub-dimension, the mean score obtained was 1.25 out of 28.

Descriptive results in weight loss groups

We determined 4 weight change categories: gained, lost, gained/lost, and no change. We used One-Way ANOVA to compare these 4 groups' BMI, CAS, Restriction, and Binge Eating Scores. Table IV shows the highest and lowest scores for each group. Table IV shows the descriptive findings in weight loss groups.

Scale discriminant function states in groups

We performed Canonical Discriminant Function analyses on the restriction, CAS, and binge eating scores in various demographic groups. As a result, we were able to determine the groups and subgroups in which the scales performed better (Table V shows the discriminant function states of the scales based on weight gain/loss groups).

Among the weight gain and loss groups, the married*male group had the highest function CAS scores. Among the weight gain/loss and no change groups, the highest function binge eating disorder scores were found in the female group. Among the weight-gained and unchanged groups, the highest function was restriction scores in the male group, and binge eating disorder scores in the female group. Among the weight loss and unchanged groups, the significantly highest function restriction scores belonged to the married group.

Discussion

Hypotheses Realization and Comparison with Previous Research

The "CAS" variable had a significant effect on the LLS in our study, and there was a posi-

tive relationship between CAS and EDRS. Anxiety Level regarding COVID-19 for eating disorder revealed that eating disorder had an effect on Eating Disorder Scores.

In our study, there was no significant relationship between CAS and binge eating disorder in the model.

Individuals' high levels of anxiety in the COVID-19 process are underlined in some studies[28,29]. A study[30] conducted in Ankara found that, during the pandemic, 53.8% of personnel reported moderate to severe anxiety. Guo et al[31] confirmed this finding. During the COVID-19 process, 36.5% of healthcare professionals in Brazil reported mild-moderate anxiety, according to a study[7] conducted using the Depression-Anxiety and Stress Scale (DASS-21). During the process, anxiety was found to be prevalent in 22.1% of healthcare workers in a meta-analysis study[2]. Another study[32] with CAS in healthcare personnel found an average score of 3.43.

The mean CAS scores of health professionals with a master's degree or higher in our study were 1.36 for men and 1.27 for women (overall = 1.35), and the majority of these cases scored low in the rankings. This result differed from the literature in terms of both the general average and the severity level, most likely due to the selection criteria favoring a specific group – in this case, those with Master's degrees and above.

A Master's thesis study[33] found a link between emotional eating total scores and CAS in people aged 18 to 65. In our study, CAS scores were significantly influential on the general scores of the main dimensions of EDRS in the model (restriction, eating anxiety, weight anxiety, body shape). Furthermore, there was a positive relationship between CAS and EDRS scores. In terms of EDRS scores, the situation was comparable to the literature, except for the fact that our model indicated no significant relationship between CAS and the scores of binge eating, a sub-dimension of the EDRS[34].

Table II. Descriptive characteristics of study groups by COVID-19 diagnosis.

	Covid Diagnosis +		Covid Diagnosis -		Total		
n:	(%)	Mean±SD. n:	(%)	Mean±SD. n:		Mean±SD. (%)	p
Age							
Male	52	30.38 ± 5.61	30	30.33 ± 5.96	184	30.37 ± 5.71	.969
Female	132	30.97 ± 7.04	79	31.01 ± 5.44	109	30.99 ± 6.47	.963
Total	184	30.80 ± 6.65	109	30.83 ± 5.57	293	30.81 ± 6.26	.978
BMI							
Male	52	25.48 ± 3.07	30	26.12 ± 3.83	184	25.72 ± 3.35	.407
Female	132	22.16 ± 3.74	79	23.27 ± 3.93	109	22.57 ± 3.84	.042
Total	184	23.09 ± 3.86	109	24.05 ± 4.09	293	23.45 ± 3.97	.046
University graduation time period							
Male	52	7.15 ± 6.92	30	6.37 ± 6.30	184	6.87 ± 6.67	.610
Female	132	7.65 ± 6.71	79	7.91± 5.30	109	7.75 ± 6.21	.756
Total	184	7.51 ± 6.75	109	7.49 ± 5.61	293	7.50 ± 6.34	.974
Smoking status							
No	140	(76.1)	98	(89.9)	238	(81.2)	.006
Yes	44	(23.9)	11	(10.1)	55	(18.8)	
General	184	(100)	109	(100)	293	(100)	
Chronic Diseases							
Yes	27	(14.7)	23	(21.1)	50	(17)	.210
No	157	(85.3)	86	(78.9)	243	(83)	
Total	184	(100)	109	(100)	293	(100)	
Employment in any COVID-19 Unit							
Yes	134	(72.8)	79	(72.5)	213	(72.7)	1.00
No	50	(27.2)	30	(27.5)	80	(27.3)	
Total	184	(100)	109	(100)	293	(100)	

Table III. Descriptive characteristics of study groups by COVID-19 diagnosis.

	Covid Diagnosis -		Covid Diagnosis +		
	n:	Mean±SD. (%)	n:	Mean±SD. (%)	*p*
EDRS-Restriction					
Male	52	1.12 ± 1.43	30	1.19 ± 1.60	.829
Female	132	1.06 ± 1.34	79	1.60 ± 1.30	.005
Total	184	1.08 ± 1.36	109	1.48 ± 1.39	.014
EDRS-Eating Anxiety					
Male	52	0.64 ± 0.89	30	0.61 ± 0.84	.859
Female	132	0.55 ± 0.88	79	0.72 ± 0.88	.162
Total	184	0.57 ± 0.88	109	0.69 ± 0.85	.272
EDRS- Body anxiety					
Male	52	1.86 ± 1.43	30	1.69 ± 1.15	.572
Female	132	1.70 ± 1.47	79	2.05 ± 1.50	.096
Total	184	1.75 ± 1.45	109	1.95 ± 1.42	.237
EDRS-Weight anxiety					
Male	52	1.39 ± 1.11	30	1.42 ± 1.25	.918
Female	132	1.34 ± 1.21	79	1.64 ± 1.34	.093
Total	184	1.34 ± 1.18	109	1.58 ± 1.31	.130
EDRS-General Score					
Male	52	1.25 ± 1.03	30	1.23 ± 1.03	.909
Female	132	1.16 ± 1.01	79	1.50 ± 1.02	.019
Total	184	1.19 ± 1.01	109	1.43 ± 1.03	.053
EDRS-Binge Eating					
Male	52	1.53 ± 2.32	30	0.91 ± 1.39	.185
Female	132	1.22 ± 1.95	79	1.19 ± 1.87	
	.935				
Total	184	1.30 ± 2.06	109	1.12 ± 1.75	.424
CAS					
Male	52	0.98 ± 2.05	30	1.23 ± 2.28	.608
Female	132	1.51 ± 2.44	79	1.28 ± 2.12	.475
Total	184	1.36 ± 2.34	109	1.27 ± 2.15	.722

In a study by Süel et al[34] conducted on sports science students in Niğde, high eating attitude scores were found during the COVID-19 process, which had a negative effect. In another study[35] conducted on individuals over the age of 19 across Turkey, autorectic tendencies were detected in 68.2% during the COVID-19 process. Higher rates were found for men and those in employment. In another survey study conducted by Okat and Özer[36] across Turkey during the COVID-19 process, emotional eating scores were found to be higher in women, singles, and those not in unemployment.

In our study, eating attitudes were assessed using EDRS, which includes sub-dimensions for binge eating (Binge Eating) and eating restriction (Restriction). During the COVID-19 process, we were able to obtain two-way information about the target population. The average score in the restriction was 1.24 out of 6.

The EDRS Score's other sub-dimensions include eating, weight, and body shape. The CAS scale has shown a positive correlation status among the factors affecting the EDRS, as stated above. Correlations between CAS and sub-dimensions showed strong correlations in the form of 'body shape' (R=0.919), 'weight worry' (R=0.893), 'eating worry' (R=0.786), and 'constraint' (R=0.735). Furthermore. there was a positive correlation with BMI. The correlations between BMI and sub-dimensions showed correlations in the form of 'body shape' (R=0.491), 'weight worry' (R=0.471), 'eating worry' (R=0.356), and 'constraint' (R=0.269). The cause was considered to be the primary influence of CAS, followed by BMI on the change in EDRS scores.

The average binge eating score was 1.25 out of 28. There was no significant relationship between binge eating and CAS. The lack of effect of this dimension on the mentioned characteristics was considered to be due to the relationship between binge eating, BMI and weight change.

In a study[37] conducted among adolescents, individuals who were female, obese, and gaining weight were especially vulnerable to emotional eating behaviors. In this case, the authors recommended preventive measures to encourage physical activity and to reduce depression and anxiety symptoms[38]. As Da Costa et al[39] reported, "those who participate in aerobic exercise have lower levels of anxiety and depression than those who participate in strength training or are inactive. The best levels of health perception are found among people who participate in strength training and aerobics". From the lifestyle medicine perspective, not only eating pattern but also exercise could be structured for improvement of health.

In our study, we investigated four different categories of weight change (gained, lost, lost/gained, unchanged). We first used a One-Way ANOVA analysis to determine which scales had the highest and lowest scores in each weight change group.

We performed "Canonical Discriminant Function" analyses of restriction, CAS, and binge eating scores on 'weight change' groups in different demographic groups to find the groups and subgroups for which the scales were more functional. Among the weight gain and loss groups, the married*male group had the highest function CAS scores. Among the weight gain/loss and unchanged groups, the significantly highest function in the Female group were found for 'binge eating' scores. Among the 'weight gained' and 'unchanged' groups, the significantly highest function "restriction" scores in the male group were for the binge eating scores in the female group. Among the weight loss and unchanged groups, the married group had the highest function 'restriction' scores.

H2.0 - Having COVID-19 has no effect on Eating Disorder Scores / H2.1 - Having COVID-19 has an impact on Eating Disorder Scores

The interaction of "sex*COVID-19 Diagnosis" had a significant effect on Binge Eating scores in our model. The mean of those with "COVID-19 Diagnosis=No" in the "Smoking=No" group was higher than those with "COVID-19 Diagnosis=Yes" in the male gender group. The mean of those with "COVID-19 Diagnosis=Yes" in the "Smoking=Yes" group was higher than that of those with "COVID-19 Diagnosis=No". The mean of those with "COVID-19 Diagnosis=Yes" in the

Table IV. Descriptive findings in weight loss group.

		N	Mean	Std. Deviation	Minimum	Maximum	p
BMI	Gained	136	24.426	3.8372	16.9	42.2	
	Lost	28	22.945	4.8082	16.3	38.7	
	Gained/Lost	11	22.457	2.2052	17.9	27.2	.001
	No Change	109	22.447	3.7455	15.1	39.5	
	Total	284	23.444	3.9577	15.1	42.2	
Restriction	Gained	136	1.4500	1.45281	.00	6.00	
	Lost	28	1.4214	1.73619	.00	6.00	
	Gained/Lost	11	1.2727	1.53433	.00	3.60	.027
	No Change	109	.9248	1.14755	.00	5.00	
	Total	284	1.2387	1.39390	.00	6.00	
Binge- Eating	Gained	136	1.5000	2.16776	.00	12.33	
	Lost	28	1.1726	2.00385	.00	7.50	
	Gained/Lost	11	1.9697	3.19272	.00	10.00	.063
	No Change	109	.8960	1.42721	.00	10.00	
	Total	284	1.2541	1.96502	.00	12.33	
CAS	Gained	136	1.3162	2.21678	.00	10.00	
	Lost	28	1.8929	3.17792	.00	13.00	
	Gained/Lost	11	1.8182	2.85721	.00	9.00	.464
	No Change	109	1.1927	2.04793	.00	9.00	
	Total	284	1.3451	2.29008	.00	13.00	

Table V. Discriminant function states of the scales based on weight gain/loss groups.

Marital Status	Gender	Weight Chance		Mean	Std. Deviation	Valid N (list wise)	
						Unweighted	Weighted
Married	Male	Gained	CAS	.2353	.56230	17	17.000
			Restricted	1.1765	1.05566	17	17.000
			Binge-Eating	2.1667	3.17980	17	17.000
		Lost	CAS	4.6667	5.03322	3	3.000
			Restricted	2.6000	1.90788	3	3.000
			Binge-Eating	1.6667	2.88675	3	3.000
		Total	CAS	.9000	2.35975	20	20.000
			Restricted	1.3900	1.26237	20	20.000
			Binge-Eating	2.0917	3.07008	20	20.000

"Smoking=No" group was higher in those with "COVID-19 Diagnosis=No" in the female gender group. The mean of those with "COVID-19 Diagnosis=No" in the "Smoking=Yes" group was higher than that of those with "COVID-19 Diagnosis=Yes". H2.1 was accepted for the binge eating variables sub-dimensions.

In addition, examining other sub-dimensions affecting this variable, the adjusted averages were found to be higher in the married group of non-smokers and in the single group of smokers. High averages were detected in singles without Chronic Disease, while the averages in married people were very close.

H3.0 - Working in the COVID-19 Unit has no effect on Eating Disorder Scores / H3.1 - Working in the COVID-19 Unit has an impact on Eating Disorder Scores

The interaction of "marital status*COVID-19 Study" had a significant effect on the EDRS scores in general in our study model. Higher averages were found in singles and working people. Furthermore, the other sub-dimensions effective on this variable revealed higher adjusted averages in single smokers and married non-smokers. Those in the male gender group who had "COVID-19 Diagnosis=Yes" and "COVID-19 Study=Yes" also had "COVID-19 Diagnosis=Yes" in the female gender group. Those who answered "COVID-19 Study=Yes" and "COVID-19 Diagnosis=No" had higher averages than those who answered "COVID-19 Study=No." H3.1 was accepted for the EDRS sub-dimensions.

The Study's Clinical Advantages

Our study revealed detailed effects of scales and parameters related to the COVID-19 process on eating disorders and weight change in a specific population. We discussed, in various subgroups, the effects of both anxiety scores related to COVID-19 and eating disorders on various aspects and identified various variables influencing these scales in the main groups and subgroups. We attempted to clarify cause-effect relationships in the BMI and weight change groups by considering the CAS scores and Binge Eating scores in terms of cause, and the EDRS scores, particularly the "restriction" dimension, in terms of results. Several studies[40-42] have focused on the significance of eating status changes in the COVID-19 process, especially the importance of emphasizing healthy nutrition during endemic diseases. The current study provides key findings specifically relating to health professionals, who play a critical role in disease prevention. Thus, the results shed light on the precautions and guidance services needed in this situation, revealing details about the risk groups in the specific population, and the parameters associated with the risk.

Limitations

Our research was carried out among healthcare professionals with a Master's degree or higher as education status. Our study included healthcare professionals. The study met the number, power, and effect size values required; however, given the importance of the subject, it would be appropriate to include more diverse studies in the future, such as multicenter and cohort studies, and meta-analyses, as well as investigating different populations.

Conclusions

The extensive discussion of the anxiety and ED situations encountered during the COVID-19 pro-

cess in our study revealed the Anxiety and ED states in different subgroups, their interrelationships, the results of both the restriction and binge eating dimensions of ED, and various parameters affecting eating disorders in the highly educated population. Our findings have important implications for clinical practice and guidance services and form a potential basis for future studies.

Conflict of Interest

All the authors declare that they have no conflict of interest.

Ethics Approval

The research was carried out in accordance with the Helsinki Declaration. To conduct the research, permission was obtained from the Turkish Ministry of Health's COVID-19 Scientific Research Evaluation Commission. The study protocol was reviewed and approved by the Izmir University of Economics Ethical Committee (approval No.: B.30.2.İEÜSB.0.05.05-20-146).

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Authors' Contributions

OA, ÖG, HSK wrote the main manuscript text, tables, and figures. OA, ÖG, HSK, ÜBB provided the resources. OA, ÖG, HSK conducted the investigation. ÜBB and TDÖ worked on data curation. OA, ÖG, HSK worked on the conceptualization of the study. OA, ÖG, HSK, TDÖ, ÜBB approved the publication.

Informed Consent

Before the survey every participant signed for their consent.

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