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Original article

# Eating disorder and its relationship with psychological distress in the Covid-19 pandemic in Turkey

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**Abstract.** *Background and aim:* With the lockdown, panic buying, and stress in the COVID-19 pandemic, people have had a complex and problematic relationship with eating. We aimed to investigate pandemic-related stressful life events and the relationship between eating disorders and psychological distress in students continuing online education during the COVID 19 pandemic. *Methods:* This cross-sectional study included 770 students. Pandemic-related distress screening questionnaire (P- SLESQ), The Depression Anxiety Stress Scales-21 (DASS-21), and The Eating Disorder Examination Questionnaire (EDE-Q) were used for assessment. *Results:* Of the 770 participants, 593 (77.0%) were female, 741 (96.2%) were single. 5.6% of the participants had eating disorders, according to the EDE-Q cut-off score. Females reported more frequent disordered eating behaviors or cognitions than males ($p < 0.001$). Also, the students who have medical problems, self or family history of psychiatric disorders, or a history of suicide attempts reported more frequent disordered eating behaviors or cognitions. Psychological distress was found to mediate the relationship between stressful life events experienced during the pandemic and eating disorders (P=0.088). *Conclusions:* Psychological distress has a significant and positive mediating effect between stressful life events experienced during the pandemic and eating disorders in students continuing online education. The risks for eating disorders outside the time of the COVID-19 pandemic were similar to those during the pandemic. For students in Turkey, the rate of eating disorders was found to be lower in pandemic situations compared to other studies. The findings are discussed in the cultural aspect of the country.

**Key words:** eating behaviors, online education, COVID-19 lockdown, psychological distress, stressful life events

## Introduction

In March 2020, World Health Organization declared the spread of COVID-19 a global pandemic (1). The Ministry of Health in Turkey announced the first case of the 2019-2020 (COVID-19) coronavirus pandemic on March 11, 2020 (2). Primary and secondary education, high schools and universities, whose education was suspended on March 16, switched to the complete online education system as of March 23. As of April 10, 2020, the state of emergency, which imposes home confinement and shuts down public services/commercial establishments, has been declared from time to time. After April, Turkey took some decisions to gradually lift the restrictions for the first time. However, schools were mostly closed and online education continued. On September 21, 2020, face-to-face training was gradually started. While students went to school on certain days of the week (2 days), they followed their lessons online on other days. However, this application was also very short (about 2 weeks). Thus, until the period when the study started; students had been experiencing the mandatory restriction for about 8 months (3).

In the COVID-19 pandemic, humans have had a complex problematic relationship with food during times of food insecurity and panic buying. In the midst of the pandemic, conflict at home and pandemic-related disrupted lifestyle caused disordered eating patterns (4). Most people who were infected by COVID-19 had smell and taste disorders also affected the pleasure of eating (5). The COVID-19 pandemic has also had adverse effects on those who already have eating disorders (6). In a study, as many as 56% of participants reported negative changes in eating and physical activity behaviors and barriers to weight management compared to pre-quarantine in UK (7). In a study ın Turkey, participants reported increased food intake, and the majority were emotional eaters to varying degrees (8). In addition, COVID-19 has had negative effects on dietary habits, particularly unhealthy food consumption, loss of control over eating, skipping meals and snacking (9, 10). It is already known that psychological distress is associated with disordered eating behaviors such as uncontrolled and emotional eating and eating disorders, as well as obesity (11). In other words, the stress in the pandemic period was planted on the eating disorder.

All the restrictive measures that started with the pandemic, increased social distance, lockdowns; caused stress, depression, anxiety, insomnia, and post-traumatic stress in the general population. All these psychological problems have also created a burden for university students who continue online education and cannot socialize (12-14). It has been reported that young people are more sensitive to lockdown conditions and psychological distress in this process (15). Uncertainty, intolerance to uncertainty, the threat posed by the COVID-19 epidemic to people's physical health and lives, the uncertainty of the containment period, sudden school break, the economic and social consequences of the virus can be risk factors for this psychological distress (16). During pandemic, social relations deteriorated for young people who went to college. Students had to stay at home. While staying at home, they had to follow their online lessons alone. They had to wear masks on the rare occasions when they could go out. Individuals were restricted from seeing each other's clear facial expressions. All these above are just some of the factors that cause distress in students during the pandemic period.

In the studies conducted so far, we could not find a study in which eating disorders, stressful life events, and psychological distress were evaluated together in the population of university students. In this study; we aimed to investigate psychological distress, pandemic-related stressful life events and eating disorders in students who continue online education during the COVID 19 pandemic. Considering previous studies, it is aimed to test whether psychological distress has a mediating role in the relationship between stressful life events experienced during the pandemic and eating disorders.

## Methods

### *Sample and procedure*

This study was based on a cross-sectional self-assessment online survey in Turkish language between 15, October to 15 November, 2020. At the beginning of the data collection period, 342,143 COVID-19 cases were detected, and at the end, 414,278 cases were COVID-19 positive in Turkey(17) The research was approved by the Ethics Committee of a University with 079/2020 ethics committee number and was conducted in accordance with the Helsinki Declaration. A non-probability Snowball Sampling method was used. Eligible university students from two private universities from Istanbul were included in the study. The criteria for inclusion were being a university student over the age of 18, not having been diagnosed with any eating disorder, psychosis or bipolar disorder. The required sample size was determined as 384 using a single population proportion formula with assumptions: 5% type I error, 95% confidence Intervals. Following the signature of an online written informed consent, participants were invited to answer a self-reported online battery of questionnaires made available through the Google survey platform. University students randomly invited to the study via e-mail and whats-app groups. Totally, 770 students included in this study.

### *Assessment tools*

*Sociodemographic and clinic characteristics form.* 16 items in accordance with the aim of the study take

place in the form prepared by the authors. These items were age, gender, height, weight, marital status, education levels, with whom do you live, employment status, household economic situation, medical problems, history of psychiatric disorders, family history of psychiatric disorders, history of suicide attempt, smoking, alcohol consumption, and substance abuse.

*Pandemic related distress screening questionnaire (P- SLESQ).* The scale was prepared accordance with the aim of the study by authors, using the Stressful Life Events Screening Questionnaire (18) and review of the literature, and used to measure the stressful life events burden during the pandemic. The scale consists of 16 questions answered as 0-no, 1-yes. Total scores are ranging from 0 to 16. Higher scores on the scale are associated with stressful life event burden. Cronbach's alpha internal consistency coefficient was determined as .60.

*The Depression Anxiety Stress Scales-21 (DASS-21).* DASS-21 is a 21-item, self-report questionnaire designed to measure the severity of a range of depression, anxiety and stress symptoms. Each item of the DASS corresponds to one of the three subscales (depression, anxiety, and stress) with 7 items per sub-scale. The scale is a 4-point Likert from 0 (never) to 3 (almost always) and evaluates symptoms from last week. Higher scores on each sub-scale are associated with high depression, anxiety and stress (19). The Turkish version of DASS-21 has excellent internal reliability and Cronbach's alphas range from 0.87 to 0.90 (20). They indicated that this scale had adequate psychometric properties in non-clinical samples.

*The Eating Disorder Examination-Questionnaire (EDE-Q).* EDE-Q is a 28-item questionnaire that is used to examine disordered eating cognitions and behaviors over the previous 4 weeks (21). It consists of 22 items and four subscales with scores ranging from 0 to 6; restriction, eating concerns, weight concerns, and shape concerns. The score is calculated by averaging the four subscales, and higher scores indicate more frequent disordered eating behaviors or cognitions. The Turkish validity and reliability of the study has been conducted in the nonclinical adolescent samples in 2011, with an internal consistency of α=0.93 (22). The cut-off score indicating the possible presence of an eating disorder is ≥4 (23).

*Statistical analyses*

The descriptive statistics were presented in mean, standard deviation, minimum–maximum, and median values for the quantitative variables; and frequencies and percentages for the categorical variables. Skewness and kurtosis values of normality indicates that the scales scores were normally distributed in many instances. The relationship between the numerical variables was tested using a Pearson correlation. The internal consistency of the scales and subscales were analyzed by using Cronbach's alpha coefficient and the consistency of the subscales was assessed by confirmatory factor analysis.COVID-19 pandemic impact, psychological distress variables and disordered eating behaviors mediation effects were tested with a Structural Equation Model (SEM) using Maximum Likelihood Estimation in IBM SPSS Amos™ 22.0.Statistical analysis was performed using the IBM SPSS Statistics for Windows, Version 25 (IBM SPSS Statistics for Windows, IBM Corporation, Armonk, NY)

## Results

Of the 770 participants, 593 (77.0%) were female, 741 (96.2%) were single, 692(89.9%) were university students. The age of the 533 (69.2%) students was between 18 and 22 years. We found more frequent disordered eating behaviors or cognitions in females than males (p <0.001), in students who have medical problems than who don't have (p=0.019), in students who have family history of psychiatric disorders than who don't have (p=0.005) (Table 1). The socio-demographic characteristics of the participants and comparisons in terms of EDE-Q scale are shown in Table 1.

47 (6.1%) of the participants were diagnosed with COVID-19. 173 (22.5%) of the participants were mandatory quarantined due to COVID-19. 531 of them (69%) felt that Covid-19 was threatening the life of a close friend or his/her family member. 29 (42.7%) had a family member or close friend diagnosed with COVID-19. Stressful life events list due to the pandemic are shown in Table 2.

The mean score of DASS-21 depression, anxiety and stress was 6.89 ±5.00, 4.84 ± 3.94, and 7.26 ±

**Table 1.** The sociodemographic characteristics of the participants.

| Variables | n (%)/ Mean (SD) | EDE-Q Mean (SD) | t/F |
|---|---|---|---|
| Age, years. Mean (SD) | | p=0.613 | 0.506 |
| 18-22 | 533 (69.2) | 1.28 (1.37) | |
| 23 and above | 237 (30.8) | 1.22 (1.27) | |
| Gender (Eating Disorders) | | p <0.001*** | 4.174 |
| Female | 593 (77.0) | 1.36 (1.40) | |
| Male | 177 (23.0) | 0.94 (1.08) | |
| Marital status | | p=0.771 | -0.292 |
| Single | 741 (96.2) | 1.26 (1.34) | |
| Married | 29 (3.8) | 1.19 (1.33) | |
| Education | | p=0.705 | 0.379 |
| University | 692 (89.9) | 1.27 (1.36) | |
| Postgraduate and above | 78 (10.1) | 1.201(1.20) | |
| With whom do you live | | p=0.766 | 0.382 |
| With parents | 628 (81.6) | 1.27 (1.34) | |
| Alone-at home | 48 (6.2) | 1.06 (1.15) | |
| Dorm | 41 (5.3) | 1.31 (1.59) | |
| Other | 53 (6.9) | 1.28 (1.32) | |
| Employment Status | | p=0.609 | -0.511 |
| Employed | 96 (12.5) | 1.19 (1.26) | |
| Not Employed | 674 (87.5) | 1.27 (1.35) | |
| Household economic situation | | p=0.733 | 0.311 |
| Bad | 52 (6.8) | 1.18 (1.33) | |
| Average | 283 (36.8) | 1.22 (1.30) | |
| Good or very good | 435 (56.5) | 1.29 (1.37) | |
| Medical problems | | p=0.019* | |
| No | 711 (92.3) | 1.23 (1.34) | -2.351 |
| Yes | 59 (7.7) | 1.65 (1.33) | |
| History of Psychiatric Disorders | | p <0.001*** | -3.688 |
| No | 634 (82.3) | 1.18 (1.31) | |
| Yes | 136 (17.7) | 1.64 (1.40) | |
| Family history of psychiatric disorder | | p=0.005** | -2.870 |
| No | 657 (85.3) | 1.20 (1.32) | |
| Yes | 113 (14.7) | 1.61 (1.43) | |
| Suicide attempt | | p <0.001*** | -4.203 |
| No | 732 (95.1) | 1.21 (1.32) | |
| Yes | 38 (4.9) | 2.14 (1.51) | |
| Smoking | | p=0.773 | 0.289 |
| No | 642 (83.4) | 1.27 (1.38) | |
| Yes | 128 (16.6) | 1.23 (1.14) | |
| Alcohol consumption | | p=0.933 | 0.084 |
| No | 692 (89.9) | 1.26 (1.35) | |
| Yes | 78 (10.1) | 1.25 (1.27) | |

Note.4 (1.1%) participants reported substance abuse and not performed analysis for those.

4.74 respectively. The mean score of EDE-Q restrain, eating concerns, weight concerns, and shape concerns was 1.22±1.34, 0.83±1.13, 1.36±1.59, and 1.64±1.3 respectively. According to the EDE-Q cut-off score, 43 (5.6%) of the participants had probable eating disorders. Psychometric Properties for all Scales and Subscales are shown in Table 3.

The correlations between stressful life events experienced during the pandemic, psychological distress (anxiety, depression, stress) and eating disorders are shown in Table 4.

A positive and significant relationship was found between the P- SLESQ and depression (r =.332), anxiety (r =.331), stress (r =.334), and EDE-Q (r =.184). According to these results, it was assumed that psychological distress played a mediating role in the relationship between stressful life events experienced during the pandemic and eating disorders. Structural equation modeling was used to test the default model. First, a measurement model was established to test the validity of the relationships between stressful life events, eating disorders, psychological distress (anxiety, depression, stress) latent variables experienced during the pandemic process. In the first measurement model, $\chi^2$/sd = 4.88, RMSEA = 0.071, CFI = 0.99, SRMR = 0.04, IFI = 0.99, GFI = 0.97. When we examine the

**Table 2.** P- SLESQ: Pandemic-related distress screening questionnaire (Stressful life events list due to the pandemic).

| n=770 | n (%) | [95% CI] |
|---|---|---|
| 1. Diagnosed with COVID-19 | 47 (6.1) | [0.04, 0.08] |
| 2. Hospitalized due to COVID-19 | 3 (0.4) | [0.00, 0.01] |
| 3. Mandatory quarantined due to COVID-19 | 173 (22.5) | [0.20, 0.25] |
| 4. Felt the covid-19 disease is threatening my life | 466 (60.5) | [0.58, 0.64] |
| 5. Felt the covid-19 disease is threatening life of a close friend or my a family member | 531 (69.0) | [0.66, 0.72] |
| 6. A family member or a close friend diagnosed with COVID-19 | 329 (42.7) | [0.39, 0.46] |
| 7. A family member or a close friend hospitalized due to COVID-19 | 143 (18.6) | [0.15, 0.21] |
| 8. Experienced the death of a close friend or a family member due to COVID-19 | 62 (8.1) | [0.06, 0.10] |
| 9. Experienced serious economic difficulties due to the pandemic | 206 (26.8) | [0.24, 0.30] |
| 10. Trouble meeting food needs due to the pandemic | 85 (11.0) | [0.09, 0.13] |
| 11. Trouble meeting shelter needs due to the pandemic | 31 (4.0) | [0.03, 0.05] |
| 12. Trouble meeting health needs due to the pandemic | 205 (26.6) | [0.24, 0.30] |
| 13. Experienced/witnessed physical assault during the epidemic | 37 (4.8) | [0.03, 0.06] |
| 14. Experienced/witnessed sexual assault during the epidemic | 3 (0.4) | [-0.00, 0.01] |
| 15. Experienced/witnessed an extremely stressful event due to the pandemic that have not yet mentioned to anyone | 201 (26.1) | [0.23, 0.29] |

COVID-19: Corona Virus Disease 2019

values, it is seen that the measurement model formed by three latent variables is valid. The fit values we obtained after testing the hypothetical model are $\chi^2$/sd = 4.88, RMSEA = 0.07, CFI = 0.99, SRMR = 0.04, IFI = 0.99, GFI = 0.97. When we checked the adjustment values, it was determined that the hypothetical model, which is the mediator role of psychological problems in the relationship between stressful life events experienced during the pandemic and eating disorder, is valid. Psychological distress has been found to have a mediating role in the relationship between stressful life events experienced during the pandemic and eating disorders [(b = 0.05 (CI – 0.01, 0.10), β = 0.06, p = 0.088)]. It has been found to be significant in its indirect effect (the mediating role of psychological distress in the relationship between stressful life events experienced during the pandemic and eating disorder). [(b = 0.09 (CI 0.06, 0.12), β = 0.13, p < 0.000)]. Finally, the overall effect of stressful life events experienced during the Pandemic on eating disorder was significant before adding the mediator variable [(b = 0.14 (CI 0.09, 0.19), β = 0.19, p < 0.000)]. These results show that psychological distress has a significant and positive mediating effect (Figure 1).

**Table 3.** Psychometric properties for self-rating scales and subscales.

| Scales | n (%)/ Mean (SD) | [95% CI] | Cronbach α |
|---|---|---|---|
| EDE-Q total | 1.26 (1.34) | [1.17-1.36] | 0.949 |
| Restraint | 1.22 (1.50) | [1.11-1.32] | 0.850 |
| Eating concerns | 0.83 (1.13) | [0.75-0.91] | 0.787 |
| Weight concerns | 1.36 (1.59) | [1.25-1.47] | 0.834 |
| Shape concerns | 1.64 (1.73) | [1.51-1.76] | 0.908 |
| EDE-Q cut off score | | | |
| ≥4 | 43(5.6) | | |
| 4 below | 727(94.4) | | |
| DASS-21 total score | | | |
| Depression | 6.89 (5.00) | [6.53-7.24] | 0.898 |
| Anxiety | 4.84 (3.94) | [4.56-5.12] | 0.831 |
| Stress | 7.26 (4.74) | [6.92-7.59] | 0.882 |
| P- SLESQ | 3.28(2.18) | [3.12-3.43] | 0.631 |

Abbreviations: CI: Confidence Interval; NACM: Negative alterations in cognitions and mood; DASS-21: Depression, anxiety and stress scale-21; P- SLESQ: Pandemic-related distress screening questionnaire.

**Table 4.** The Relationship between P- SLESQ, EDE-Q and DASS-21 Scale in the Pandemic Process.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. P- SLESQ | 1 | | | | | | | | |
| 2. Anxiety | ,332** | 1 | | | | | | | |
| 3. Depresssion | ,331** | ,740** | 1 | | | | | | |
| 4. Stress | ,334** | ,766** | ,807** | 1 | | | | | |
| 5. EDE-Q | ,184** | ,297** | ,307** | ,299** | 1 | | | | |
| 6. Restriction | ,115** | ,115** | ,132** | ,135** | ,815** | 1 | | | |
| 7. Body shape concerns | ,179** | ,318** | ,355** | ,333** | ,945** | ,651** | 1 | | |
| 8. Eating concerns | ,183** | ,359** | ,328** | ,326** | ,873** | ,598** | ,791** | 1 | |
| 9. Weight concerns | ,187** | ,292** | ,292** | ,286** | ,950** | ,668** | ,918** | ,803** | 1 |

**p<0.01 *p<0.05 Pearson correlation analysis

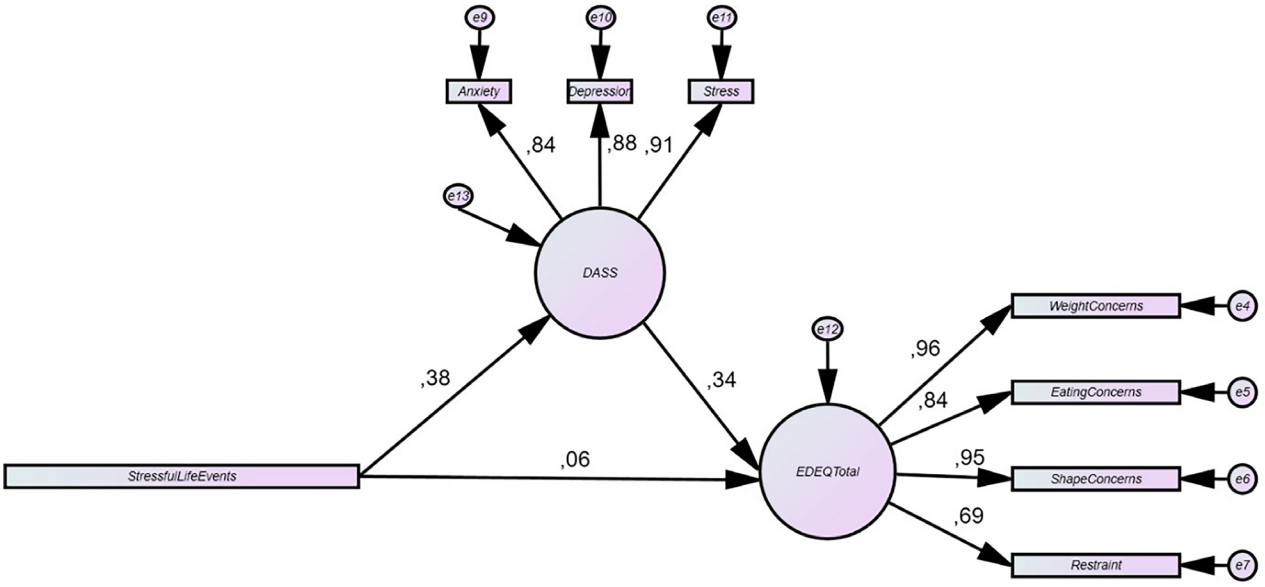


**Figure 1.** Stressful life events score (P- SLESQ), EDE-Q and DASS-21 hypothetical model established with latent variables.

## Discussion

This study investigated the eating disorders, psychological distress and stressful life events experienced during the pandemic in students continuing online education in Turkey. The most reported stressful life event due to the pandemic was the feeling that the covid-19 disease was threatening the life of a close friend or family member. According to the EDE-Q cut-off score, 5.6 % of the participants had probable eating disorders. Some socio-demographic characteristics were more often associated with disordered eating behaviors or cognitions. These; female gender, having medical problems, having a family history of psychiatric disorders, or a history of suicide attempt. There was a positive correlation between stressful life events experienced during the pandemic and eating disorders. Psychological distress was found to have a mediating role in this positive relationship between stressful life events experienced during the pandemic and eating disorders.

Studies showing the effects of the COVID-19 pandemic on eating disorders are increasing rapidly. In the months preceding the COVID-19 outbreak, WHO reported the global prevalence rates of eating pathology diagnoses as 9% (WHO, 2019). A meta-analysis showed that Eating pathology symptoms increased significantly compared to the pre-COVID-19 era (15.3%-23.3%) (24). Using the electronic health records of 5.2 million people under the age of 30, mostly in the USA, the incidence of diagnosis of eating disorders was found to be 15.3% higher than in the years before 2020(25). Approximately 31.5% of students were found to be at high risk of developing an eating disorder among Saudi female university students during the COVID-19 pandemic (26). In a study conducted in Australia, 27.6% of the general population reported higher levels of food restriction than before COVID-19, and 34.6% reported increased binge eating behaviors (27). Low rate (5.6%) found in our study may indicate that the stress caused by the pandemic increases the eating disorder less in Turkish culture. Eating habits is a cultural element. The Turkish culinary culture is in the third place in the world. Cooking, feeding and storage methods are important aspects of culture (28). For example, food storage habit. The pantry is the place where winter foods and materials that are too much for daily use in the kitchen are stored. It is found in almost every house and is located in a place associated with the kitchen. In the pantry, the materials are stored by arranging them on shelves, putting them in big chests, sacks, stringing on ropes and hanging them on the wall (29). In other words, storage and consumption of stored food piece by piece over time is already an ongoing tradition in our country. An event for food storage during the pandemic period has clearly revealed this aspect of this culture. A curfew was declared on the night of April 10, 2020 to prevent the coronavirus epidemic. The relevant statement was made about 2 and a half hours ago before curfew. It caused a "stampede" in the markets.On the other hand, the fact that obesity rates are high in our country suggested that eating disorders might have increased. The prevalence of obesity, which was found to be 30.3% on the general average before the pandemic (30). Perhaps the eating pattern had changed in a more positive way, but since these patterns were not evaluated in the study, we cannot comment. We can conclude that the rate of eating disorders is low compared to other countries. In another study from Turkey, it was found that the healthy eating index of 30.7% of the students was normal(31). At this point, the fact that students living outside the city have returned to their homes and families due to the pandemic, and that they have started to eat planned meals with the family may be factors that can lead to positive changes in eating disorders. Because, it is one of the characteristics of our culture that the meals are eaten together and on time in the family in our country.

We found that female gender, having medical problems, having a family history of psychiatric disorders, or a history of suicide attempt were more often associated with disordered eating behaviors or cognitions in students. These factors are compatible with the risk factors for eating disorders outside the pandemic period. Young adult females were reported to be at a high risk groups to developing eating disorders (32). It has also been reported that most of the suicide risk in eating disorders is driven by concomitant psychopathology and genetic factors (33).

One of the most important results of this study is that psychological distress played a mediating role in the relationship between stressful life events experienced during the pandemic and eating disorders. When the Stressful life events checklist, which is the basis of stress during the pandemic period, is examined, it is seen that a large part of the students has been exposed to pandemic traumas. And in our analysis using the DASS-21 scale, we determined that psychological distress may have an increasing effect on eating disorders. A study similar to ours was conducted with Portuguese adults. In this study, too; The experienced psychosocial impact of the COVID-19 pandemic has been found to have a significant indirect impact on disordered eating behaviors mediated by psychological distress (10). The key difference is that they focused on disordered eating behaviors while we were looking at potential eating disorders. Considering the biological mechanism, the mediator role of distress in eating disorder is an expected result. Eating encompasses two different components, homeostatic eating (balance of food

intake to maintain energy balance) and hedonic eating (rewarding effect of food intake). Both eating can be modulated by distress. The stress response modulates endogenous system-mediated eating behavior (34).

The most important limitation of our study is that we cannot definitively explain the cause-effect relationship due to its cross-sectional design. Separating the patients according to the presence of obesity and evaluation of impaired eating patterns would have strengthened the study. Another limitation is that the diagnoses were determined by a self-reported scale and not by a structured interview. Another limitation in this study is responders with eating disorders according to the EDE-Q questionnaire are unexpectedly low. However, the validity of this questionnaire in Turkish language is high (35).

The possibility of possible pre-pandemic influence on eating disorders cannot be excluded as the study was cross-sectional in design. Although the total EDE-Q score was below the cut-off value in most of the participants, a majority of the participants had at least one concern in the subsections. Therefore, conclusion may be possible for samples of this study had a high prevalence of concerns regarding eating but not severe enough to get diagnosed as an eating disorder.

For students in Turkey, the rate of eating disorders was found to be 5.3% in cases of pandemics such as quarantine, ongoing online education and social isolation. Depression, anxiety and stress may be one of the most important causes of eating disorders during the pandemic. The socio-demographic factors that related with eating disorders outside the time of the COVID-19 pandemic were similar to those during the pandemic. To alleviate the consequences of the COVID-19 pandemic on eating disorders, it is recommended to increase intervention approaches in coping with stress. Eating with the family and having a planned life in the family may be factors that can lead to positive changes in eating disorders for students, and it is recommended to consider them in future studies.

**Conflict of Interest:** Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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