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# Child murders: Social responses, psychosocial factors, and safeguarding measures

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Child murders trigger a very strong public reaction shaped by intense grief, anger, and demands for justice. The end of a child's life in this way is seen as a complete violation of social acceptances of childhood's innocence and need for protection (1). Such incidents create a deep shock in society and cause feelings of vulnerability and fear, especially among parents. While this collective grief and anger are often expressed through commemorations and social media campaigns, the lack of justice in response to these reactions deepens the sense of 'moral injury' in society (2). The involvement of the media in these processes increases the magnitude of the reactions and creates awareness about the need for systemic reform.

While there is intense anger towards the perpetrator, there is also a reaction against institutions such as schools, social services, and law enforcement that failed to protect the child. The question of "How could this have happened?" triggers the search for accountability and justice. Institutions that fail to protect children are questioned, and this process strengthens demands for reform.

Although reactions to child murders vary over time and across cultures, the social reflex is generally shaped around grief and a search for justice. Erasmus Darwin's 1767 statement that a person who kills a child commits the 'most unnatural crime' still manifests itself in social reactions today (3). When examining the ways in which child mur-

ders are covered in the media, it is seen that until the 1990s, reactions to child murders remained passive and targeted directly at the perpetrator as an individual, but after this period, active reactions such as protests against perpetrators, demands for legal changes and the formation of civil society organizations came to the fore (4). The media contributed to the discussion of crime as a social problem rather than an individual one. Society has become more aware that these crimes are not only a reflection of the perpetrators but also of the social structure and that the systems are inadequate to protect children (5).

The media and social media play a major role in shaping reactions to child murders. The way events are covered in the media, the emphasis on personal stories and the intense use of emotional elements result in a strong bond between the victim and the public. The widespread use of visual materials and the emphasis on emotional content can increase the public's emotional response. This role of the media sometimes causes panic; however, these responses can also raise awareness of the need for systemic change and contribute to the creation of safeguarding legislation. For example, the death of Victoria Climbié in the United Kingdom and the subsequent Laming Inquiry addressed this tragedy through the deficiencies of the system and led to radical changes in the organization and delivery of children's services (6). Similarly, the adoption of Karen's Law in the United States, which tightened the conditions of parole for offenders who commit-

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ted sexual assault, are the results of these societal responses (7).

Child murders often trigger widespread demands for reform. The accountability of institutions such as schools, social services and law enforcement agencies is questioned and the need for stronger child safeguarding laws becomes clear. Such incidents also prompt discussions of broader social issues such as poverty, mental health problems and violence. Public opinion demands that comprehensive measures be taken to prevent similar tragedies in the future. These responses reflect a deep belief in protecting the most vulnerable members of society.

As the importance of protecting and ensuring the safety of children is emphasized, the assessment and monitoring of children at risk and the recognition of sociological, psychological and systemic factors underlying child murders become more important (8). Limited data on this subject show that most children are killed by their parents or parental substitutes; therefore, child murders can be defined as a predominantly 'domestic' phenomenon (9). Clinical, sociological and demographic studies on child murders within the family are quite limited. In a study examining child murders committed within families in Finland between 1970 and 1994, it was found that 60% of the victims were male ( $n=42$ ) and 40% were female ( $n=28$ ) (10). Approximately 40% of the children were killed before the age of 1, and 80% before the age of 5; 60% of the perpetrators were identified as mothers and 40% as fathers or stepfathers. The most common methods of attack were assault, drowning and strangulation, and many of the children killed had previously been abused. While mothers were more dominant in infanticide cases, the prevalence of fathers is striking in suicide-homicide cases (10).

Child murders committed by strangers to the child are quite rare. In a study of child murders committed by strangers, it was determined that an average of seven children per year were killed in this way, mostly through sexual assaults, and usually by men between 1992 and 2000 (11).

When the past experiences of those who commit

child murders are examined, three main themes emerge: Psychological difficulties, difficulties in establishing relationships throughout life, and social isolation. It is thought that there are complex and interactive processes between all these themes. However, developmental experiences and attachment-related disorders are suggested as one of the basic precursors of murders (1). In addition, studies have shown that there is no correlation between child murders and adult murders, and this finding has been discussed in terms of the possibility that child and adult murders have different etiologies (12, 13). The sociocultural perspective on child abuse and murders is based on economic stress, social disorganization, culture of violence, and social isolation (14). It is argued that gender inequality and economic conditions are also related to child abuse, and that ensuring equal participation of women in social roles and economic measures can be effective in preventing such tragedies. In this context, the effects of factors such as family stress, social status of women, and culture of violence on child murders remain valid in all age groups (15).

In our country, scientific studies examining the characteristics of the attacker in child murders are limited to studies examining cases that meet the definition of filicide carried out by mothers and fathers. As a result of a recent study examining filicide cases that occurred between 2014 and 2023, where both mothers and fathers were the aggressors, the risk factors for mothers were determined to be depression, unemployment, young age, single status and an unwanted pregnancy. The risk factors for fathers were being divorced or in the process of divorce, low level of education, being diagnosed with a personality disorder and having access to firearms (16). As a result of another study examining filicide cases carried out between 1995 and 2000, it was determined that half of the parents were unemployed and illiterate (1).

When one looks at the public reaction that emerged after child murders, the way they were covered in the media, and scientific studies examining both social and individual risk factors, it is seen that increasing the level of education of parents, increasing social awareness about mental health, supporting women's mental health services that

include the postpartum period, making safeguarding arrangements especially for children at risk, and ensuring strong communication between responsible institutions are among the preventive measures that can be taken to prevent child murders. Measures that can be taken at the social level include moving away from a culture of violence, ensuring equal opportunities for women in society, supporting families under economic stress, and providing counseling programs for parental stress. Responding the public reaction that emerged after child murders with transparent and fair trial processes and deterrent sanctions for the guilty and responsible will support the perception of hope and trust for the future.

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# Evaluation of the Notch, IL-1 $\beta$ and Leptin Crosstalk Outcome (NILCO) signaling pathway in schizophrenia

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## SUMMARY

**Objective:** In the nervous system, processes that require high organization, such as neuronal development, adaptation, and plasticity, are controlled by various signaling pathways. Investigating the disruptions in these signaling pathways in schizophrenia aims to reveal the etiology and so probable treatment focus options of the disease.

**Method:** In this study, which we designed as a step towards finding markers in schizophrenia, we evaluated the clinical findings, anthropometric parameters, and NILCO signaling pathway together in schizophrenia.

**Results:** Our results showed that NOTCH and leptin levels in patients with schizophrenia in our study were significantly higher than in healthy individuals, and IL-1B was lower than in controls. Among the parameters we examined, a positive correlation was found between NOTCH and fat mass, fat percentage, and BMI. Leptin had positive correlations between PANSS positive score, PANSS general, and total PANSS score.

**Discussion:** This study revealed changes in NOTCH, leptin, and IL levels in schizophrenia and that these markers have a significant relationship with each other and clinical parameters.

**Key Words:** Schizophrenia, Notch, leptin, IL-1B, NILCO, PANSS

## INTRODUCTION

People with SCZ move away from interpersonal relationships and realities and live an introverted life with significant inadequacies in their thoughts, feelings, behaviors, and professions (1). This multidirectional chronic disease usually begins before age 25 and can be seen in all social classes and populations, with approximately similar incidence and prevalence rates worldwide (2). The lifetime prevalence of SCZ is 4/1000, and (3) an estimated 0.5% of individuals are diagnosed with SCZ at some time in their lives (4). The main symptoms of SCZ can be listed as hallucinations, delusions, disorganized speech and behavior, inappropriate affect, loss of cognition, and deterioration in psychosocial functioning (5). Schizophrenia (SCZ) can also cause cognitive deficits and adversely affect global func-

tionality due to its positive and negative symptoms (6).

Diagnosis of SCZ is made according to the criteria of DSM-5 (Diagnostic and Statistical Manual of Mental Disorders 5) (7) or ICD 10 (8) with observation of clinical features, and diagnosis through clinical interview may vary depending on the clinician's experience, training and adherence to the criteria. Misdiagnosis makes disease management and treatment difficult(9). Despite numerous studies, no proven biomarker has been found that can accurately predict or detect this disease at an early stage(10).

Schizophrenia is thought to be a neuro-inflammatory disease similar to Multiple Sclerosis (MS),

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Alzheimer's Disease, Parkinson and so (11). The vulnerability-stress model for schizophrenia has been proposed in the past, but this model has now turned into the vulnerability-stress-inflammation model as it has been determined that inflammation can be triggered by stress (12). According to a meta-analysis examining the relationship between schizophrenia and neuroinflammation, pro-inflammatory cytokines were found to be higher in schizophrenia patients than in the control group (13). Although the detected pro-inflammatory cytokines are not specific to schizophrenia, the interaction of cytokines and neurotransmitters may contribute to the pathophysiology of schizophrenia during brain development (14).

Notch signaling in the nervous system (15,16) is one of the central regulators of neural stem cells. It regulates neural development, such as neurogenesis, neural proliferation and differentiation, axonal growth, synaptogenesis, and apoptosis in adult brains (17). The Notch pathway plays a role in neural stem cell regulation and in the development of glial lineage cells that lead to the development of different neuronal cells and comprise more than 90% of the human brain in gliogenesis. The authors suggest two progenitors (cells that can differentiate into specific cells) originating from the primitive neural stem cell: P1, which develops into neurons, and P2, which develops into glial cells. Notch is initially responsible for inhibiting P2 from turning into neurons. After other differentiation signals begin, Notch directs the glial precursor to the glial fibrillary acidic protein (GFAP) astrocyte instead of oligodendrocyte development. Notch expression is seen both during the maintenance and proliferation of the glial precursors and in their differentiation into astrocytes, but transiently (18).

Studies have shown that Notch is associated with learning and memory (19). Curiosity about the correlation between Notch and learning and memory disability arose from the relationship between Alzheimer's Disease and a protein called presenilin1. Later, conditions causing learning disabilities in Down Syndrome and Alzheimer's began to be investigated in terms of Notch signaling. Research is insufficient to understand the exact mechanisms in humans. However, the association of Notch signaling with learning abilities has also

been demonstrated in some studies in *Drosophila* (20), *C. elegans* (21), and Notch mutant mice (22). Notch also plays a role in the relationship between immune cells and the brain in ischemic stroke (23). All these findings up to now, Notch can be considered to have a probable role in the pathogenesis of SCZ through neuroinflammation (24, 25). One of the subtypes of Notch, Notch 4, is most closely related to Sch, and the gene coding for Notch 4 is located in the major histocompatibility complex (MHC) region of 6p21.3 in humans (26).

Leptin is produced mainly by adipocytes (27) and in small amounts by the brain (28-30). The leptin produced by adipocytes and its related protein is also transmitted to the brain through the endocrine pathway (31). The literature reports that circulating leptin is associated with BMI, and antipsychotic drugs such as clozapine and olanzapine increase serum leptin levels (32-34).

Interleukin-1 (IL-1), a pro-inflammatory cytokine, has two types, IL-1a and IL-1b, whose biological activities are similar (35). Interleukin-1 (IL-1) is a central mediator of innate immunity and inflammation, and in inflammatory reactions, IL-1 affects many cell types, along with tumor necrosis factor (TNF). This cytokine's synthesis, release, and effects are highly controlled since the excess of IL-1, which benefits the body in appropriate amounts, causes harm (35).

IL-1 $\beta$  is one of the ligands of the IL-1 family with agonist activity (36). IL-1b is produced in response to TLR by hematopoietic cells such as blood monocytes, tissue macrophages, skin dendritic cells and brain microglia, activated complement components, and other cytokines such as TNF-a (37). Unlike the IL-1a precursor, the IL-1b precursor is inactive but cleaved by caspase-1, releasing the active cytokine into the extracellular space. High secretion of IL-1b is associated with inflammation in patients with auto-inflammatory diseases with specific mutations (36). In a study to investigate the pathophysiology of schizophrenia, the CSF concentration of well-characterized cytokines was analyzed in first-episode schizophrenia patients and healthy volunteers of the same age. IL-1 $\beta$  concentrations in patients were significantly higher than

controls in that study (38).

NILCO is an abbreviation for a complex signaling pathway defined between Notch, IL-1, and leptin, which initiates that pathway (Notch, IL-1, and leptin crosstalk outcome). It has been shown in the literature that leptin increases the expression of both Notch receptors and their ligands (39).

Although previous studies have been examined and there are studies examining the relationship between serum levels of leptin (40) and IL-1  $\beta$  (41) and schizophrenia, there is no study examining the relationship between Notch-4 serum level and schizophrenia. Additionally, no other study has been found examining the relationship between the NILCO pathway and schizophrenia. Our study aims to examine the correlation between NILCO pathway hormones and their relationship with schizophrenia. Our hypotheses in this study are as follows: 1) Since schizophrenia is an inflammatory disease, IL-1  $\beta$  serum level is expected to be higher than the control group. 2) The NILCO pathway is activated in schizophrenia disease. There is a relationship between positive symptoms of schizophrenia and NILCO pathway hormones. 3) The NILCO pathway is related to anthropometric parameters (weight, BMI) 4) There is a relationship between the hormones that make up the NILCO pathway.

## METHOD

### Study design

The study was planned as a cross-sectional study in the psychiatry inpatient clinic of our Medical Faculty Hospital. Ethics committee approval was obtained from the local ethics committee (15.02.2017/ 050.01.04/11). Patients hospitalized with acute psychotic symptoms and all patients have a diagnosis of schizophrenia according to DSM 5 criteria. These patients were evaluated and diagnosed by an experienced psychiatrist in the first week of their hospitalization. Inclusion criteria in the study are as follows: Patients who were diagnosed with schizophrenia between the ages of 18-65 and hospitalized with acute psychotic symptoms, patients whose consent has been obtained by themselves and their legal guardians, patients without

organic disease, patients who do not have severe and chronic diseases diagnosed in the past. Exclusion criteria in the study are as follows: Patients under 18 years of age, patients with any additional neuropsychiatric disease in the past or present, and patients who did not agree to participate. The control group was included in the study by having a consent form signed by the participants who volunteered to participate.

In the power analysis performed using the G\*Power 3.1.9.7 program, it was found that the minimum subject level to obtain the required statistical significance at the 5% significance level and 95% confidence interval (EB=1.086) was 20 (case-control) subjects each for the case and control groups (total, n=40). However, to obtain data at a higher significance level and significant results in correlation analyses, the minimum number of cases was planned as 40 cases and 40 controls (42). All patients received treatment as usual (TAU) (antipsychotic, benzodiazepine, anticonvulsant). In this study, 42 healthy male volunteers and 45 male patients who both had a diagnosis of schizophrenia according to DSM 5 criteria and were hospitalized with acute psychotic symptoms were included in the study group (SG). Female subjects were excluded from the study to avoid the confounding effect of gender.

The samples were set as two groups: schizophrenic patients (SG, n = 45) and healthy individuals (HG, n = 42) who voluntarily participated in the study. All participants or legal guardians gave written informed consent.

Schizophrenia and control groups were selected only from male patients to avoid the confounding effect of gender. Anthropometric parameters, including body mass index (BMI), fat mass (FM), fat-free mass (FFM), height, weight, basal metabolic rate (BMR), fat percentage, and total body water (TBW) measurements, were determined using Tanita bioelectrical impedance analyzer TBF-300 (Tanita Corporation, Chicago, USA). Education status, duration of illness, length of hospital stay, mental status and presence of psychosis in the family, presence of suicide, presence of additional medical assistance and medications

used, height, weight, and demographic data (gender, age, etc.) were obtained and recorded. Positive and negative syndrome scale (PANSS), Clinic global impression scale (CGI), and Global Assessment of Function (GAF) Scale were applied. Patients went on to receive medications in the general manner of daily clinical practice including antipsychotics, anticonvulsants and benzodizepines, 'treatment as usual' in Sakarya University Training and Research Hospital Psychiatry Service (43).

*Positive and Negative Syndrome Scale (PANSS):* PANSS is a 30-item semi-structured interview scale with a seven-point severity rating. The scale was developed by Kay et al. in 1987 (44). Of those 30 psychiatric parameters in PANSS, seven belong to the positive syndrome subscale, seven to the negative syndrome subscale, and the remaining 16 belong to the general psychopathology subscale.

*Clinic Global Impression Scale (CGI):* The CGI was developed by Guy (45) to assess the course of all psychiatric disorders at all ages for clinical research purposes. The CGI has three subheadings ('severity of illness,' 'recovery,' and 'severity of side effects'), and it is filled in during a semi-structured interview to assess the treatment response of people with psychiatric disorders. In this study, the 'severity of illness' subscale (CGI-S) was used for the assessments (46).

*Global Assessment of Function (GAF) Scale:* Global Assessment of Function (GAF) score The GAF is a scale that assesses a person's general functioning over a period ranging from psychological or psychiatric illness to health. GAF is a general scale that helps monitor individuals' clinical course using a single measure. With GAF, only psychological, social, and occupational functionality can be graded, but functional impairments due to physical or environmental restrictions cannot be evaluated. In this scale, which is divided into ten equal intervals between 1 and 100, individuals below 70 indicate needing treatment. Outpatients usually score between 31 and 70, and inpatients often score below 40 (47).

## Laboratory analysis

Blood samples were taken from the patients and the control group in tubes without anticoagulant (BD Vacutainer K2 plus plastic tubes, Becton Dickinson, Franklin Lakes, NJ, USA) on the first day of their hospitalization, and these samples were allowed to clot completely at room temperature. The sera were then separated by centrifugation at 5,000x at four °C for 5 minutes and stored at -80°C until the day of biochemical analysis. For biochemical analysis, Notch-4 (Cusabio, Catalog no: CSB-EL015953HU, China); Leptin (Elabscience Biotechnology Co., Ltd, Catalog No: E-EL-H0113, USA) and IL-1 beta (Invitrogen, Catalog Numbers BMS224-2 or BMS224-2TEN, ThermoFisher Scientific, USA) commercial kits were applied. Following the incubation, elimination, and color reaction steps, the color change was observed and measured using the enzyme-linked immunosorbent assay (ELISA) method (BioTek ELX50 Reader, BioTek, Instruments, Winooski, VT, USA and BioTek ELX-800 Washer, BioTek Instruments). All biomarker samples were read at 450 nm in an ELISA reader (BioTek, Epoch). The results were expressed as pg/mL, considering the given sensitivity values, and calculated from the standard curve.

## Statistical analysis

The study's data were evaluated using the SPSS for Windows 22.0 software package. Whether the continuous data conformed to the normal distribution was evaluated using skewness and kurtosis values (48). Descriptive statistics were used for sociodemographic variables. The chi-square test was used for categorical variables. The Student-t test was used to compare the mean of the variables that fit the normal distribution. The Mann-Whitney U test was used for the variables that did not fit the normal distribution in comparing the independent variables. The correlation was conducted for hormonal and clinical variables. Univariate linear regression was conducted to clarify variables that were found to be significant. Confidence interval, CI; 95%,  $p < 0.05$ , was considered statistically significant.

**Table 1.** Clinical properties of schizophrenia groups (n=45)

	mean-SD	min-max
Age of the onset of schizophrenia	24.75- 8.48	12-57
Total duration of illness (months)	166-142	6-564
Total number of hospitalizations	4.91-5.19	1-30
A mental illness in the families of our patients n (%)	15(%33)	
Psychosis in the families of our patients n (%)	8(%17)	
Suicide attempt	7(%15)	
PANSS positive score	25.88-7.04	12-43
PANSS negative score	18.40-9.34	7-43
PANSS general score	37.51-8.29	23-54
Total PANSS score	81.38-19.96	46-118
CGI score-Severity of illness	5.70-1.40	4-13
GAF score	32.77-12.32	5-65

PANSS: Positive and Negative Syndrome Scale, CGI: Clinical Global Impression, Global Assessment Scale (GAS / GAF)

## RESULTS

### General characteristics and clinical features of samples

Forty-two healthy male volunteers were included in the study as the control group (CG), and 45 male patients were diagnosed with acute schizophrenia as the study group (SG). In the CG, the mean age was found to be  $39,071 \pm 9,261$  years, and the body mass index (BMI) was found to be  $24,71 \pm 0.77$ . Those parameters in the SG group were found as  $39,11 \pm 1,93$  years for age and  $26.26 \pm 0.84$  for BMI. No statistically significant difference was found between those groups ( $p < 0.05$ ) when compared in terms of age ( $t = -.016$ ,  $p = 0.987$ ) and BMI ( $t = -1.150$ ,  $p = 0.254$ ). The clinical properties of SG are given in Table 1.

### Comparisons of the biochemical parameters

According to biochemical analysis, Notch 4 and leptin serum levels were significantly higher, but IL-1 $\beta$  lower in the SG group than in the control group (Table 2).

### Correlation of hormonal levels and clinical features in patients with acute schizophrenia

**Table 2.** Comparison of the biomarkers in groups

Biochemical serum levels	Control Group mean-SD	Schizophrenia Group mean-SD	t value	p value
Notch4	-1.042-0.111	-0.953-0.188	-2.644	0.010*
IL-1	-1.187-0.060	-1.217-0.048	2.495	0,015*
Leptin	-0,773-0.297	-0.641-0.257	-2.217	0.029*

\* $p < 0.05$ , All hormone values were not normally distributed and were log-transformed to fit the normal distribution.

Leptin had positive correlations between PANSS positive score ( $p = 0.005$ ,  $r = 0.409$ ), PANSS general ( $p = 0.012$ ,  $r = 0.373$ ) and total PANSS score ( $p = 0.009$ ,  $r = 0.389$ ). A positive correlation was found between NOTCH between fat percentage and BMI (Table 3). There was no significant relationship between age of the patient, duration of illness, duration of hospitalization and total number of hospitalizations, and hormonal levels ( $p > 0.05$  for all)

### Regression model

Finally, we constructed a univariate linear regression model to evaluate the effect of hormone level and clinical variables on three different PANSS scores, the ones with significant results up to here, as dependent variables (positive, general, and total). We used the backward method, in which all

**Table 3:** Correlation of hormonal levels and clinical features in patients with acute schizophrenia

	NOTCH	IL-1	Leptin
NOTCH	r	,127	,247
	p	,434	,115
IL-1	r	,127	-,011
	p	,434	,945
Leptin	r	,247	-,011
	p	,115	,945
PANSS positive score	r	,276	-,014
	p	,076	,927
PANSS negative score	r	-,124	-,121
	p	,433	,438
PANSS general score	r	-,061	,032
	p	,701	,841
Total PANSS score	r	-,022	-,073
	p	,892	,648
CGI score-Severity of illness	r	-,010	,011
	p	,950	,944
GAF score	r	-,053	-,109
	p	,738	,487
BMI	r	,326	-,102
	p	,010	,424
BMR	r	,134	,207
	p	,402	,189
Fat percentage	r	,343	-,053
	p	,028	,738
Fat mass	r	,308	-,022
	p	,050	,888
TBW	r	,106	,193
	p		,136



**Table 4.** Linear regression models for PANSS scores

PANSS Positive	B	Std. Error	Beta	t	p	95.0% CI for B	
						Lower	Upper
Constant	18,899	17,365		1,088	0,286	-16,732	54,530
Number of hospitalization	-0,661	0,163	-0,498	-4,054	0,000	-0,995	-0,326
Leptin	10,299	3,065	0,367	3,360	0,002	4,010	16,588
GAF	-0,503	0,073	-0,788	-6,882	0,000	-0,653	-0,353
Age	0,174	0,061	0,307	2,830	0,009	0,048	0,300
IL1B	-17,063	14,377	-0,124	-1,187	0,246	-46,562	12,436
BMI	0,211	0,136	0,160	1,554	0,132	-0,68	0,490
<b>PANSS General</b>							
Constant	66,531	6,146		10,825	0,000	53,979	79,083
GAF	-0,270	0,098	-0,365	-2,739	0,010	-0,471	-0,069
Leptin	15,816	4,341	0,486	3,643	0,001	6,951	24,682
BMI	-0,373	0,195	-0,245	-1,918	0,065	-0,771	0,024
<b>PANSS Total</b>							
Constant	143,743	15,821		9,085	0,000	111,431	176,054
GAF	-0,729	0,253	-0,401	-2,877	0,007	-1,247	-0,212
Leptin	35,324	11,175	0,441	3,161	0,004	12,502	58,146
BMI	-0,590	0,501	-0,157	-1,178	0,248	-1,614	0,433

significant variables and crucial ones according to previous literature were included, and eight variables (leptin, hospitalization number, BMI, NOTCH, GAF, IL-1 $\beta$ , age, age of the onset of schizophrenia) were added at the first step for all dependent variables linear regression analyses.

PANSS positive score (dependent); SPSS program suggested five models. The model that included six variables (leptin, IL-1 $\beta$ , hospitalization number, GAF, age, and BMI) was the most appropriate one with the highest adjusted R<sup>2</sup>. This model was statistically significant (F= 12.663, p: 0.000, CI; %95) and explained % 68.0 of the variance (Adjusted R<sup>2</sup>; 0.680). The variables had no autocorrelation and multicollinearity (Durbin-Watson; 1.965 max VIF score:  $\pm$ 1.551). Leptin, GAF, hospitalization number, and age were significant (CI; %95, p<0.05) (Table 4).

PANSS general score (dependent); SPSS program suggested six models. The model that included three variables (leptin, GAF, and BMI) was most appropriate with the highest adjusted R<sup>2</sup>. This model was statistically significant (F= 11.179, p: 0.000, CI; %95) and explained %48.1 of the variance (aR<sup>2</sup>; 0.481). The variables had no autocorrelation and multicollinearity (Durbin-Watson; 1.8719 max VIF score:  $\pm$ 1.127). Leptin and GAF were significant (CI; %95, p<0.05) (Table 4).

PANSS total score (dependent); SPSS program suggested seven models. The model that included six variables (leptin, GAF, BMI) was most appropriate.

This model was statistically significant (F= 9,385 p: 0,000, CI; %95) and explained % 43,3of the variance (R<sup>2</sup>; 0.433). The variables had no autocorrelation and multicollinearity (Durbin-Watson; 2.091 max VIF score:  $\pm$ 1.132). Leptin and GAF were significant (CI; %95, p<0.05) (Table 4).

## DISCUSSION

Several main findings were found at the end of this study. First, schizophrenia patients have higher NOTCH and leptin and lower IL-1 $\beta$  serum levels compared to the control group. Second, a positive correlation exists between positive and general PANSS scores and leptin levels. Third, a positive correlation was found between NOTCH, fat percentage, and BMI. In the linear regression analysis, leptin remained a significant predictor of PANSS scores.

In our study, serum Notch was found to be higher in patients with schizophrenia compared to controls. Previous research conducted by Hoseth EH et al. presented evidence that attenuated Notch activity in patients with bipolar disorders and schizophrenia compared to controls. In this study, they detected an increase in DLL1 level, a potential inhibitor for Notch signaling, and genetic expression changes impair intracellular Notch signaling in patients with schizophrenia (25).

The relationship between Notch and lipid metabolism has yet to be well known. The interaction of Notch and leptin and the effect of body

composition on this have been shown in a few publications. In a study conducted on the Ad-NICD (Notch intracellular domain) mice, it was shown that increased Notch signal in mouse adipocytes leads to enlargement of white adipose tissue and ectopic lipid accumulation. Ad-NICD male mice overexpress the NICD, specifically in adipocytes. It is also noteworthy that the leptin levels of 3-month-old Ad-NICD mice in that publication were six times lower than the levels of 1-month-old mice of the same genotype (49). There are publications reporting that the Notch signal increases with increasing fatty diet in PVAT (perivascular adipose tissue), and thus, the Notch signal promotes adipogenesis and lipid accumulation. In our study, a non-strong correlation was found between fat percentage and BMI and Notch. Although this does not indicate a causal relationship, it can be considered as a finding that encourages further research in the clinical population. Leptin is perceived as a feeding-control parameter. There are studies showing that medication, especially olanzapine use, increases leptin levels compared to pre-treatment. Circulating ghrelin concentration increases under conditions of negative energy balance, such as starvation and anorexia nervosa. Circulating ghrelin is reduced in conditions of positive energy balance, such as nutrition and obesity. Ghrelin provides a peripheral signal to the hypothalamus to stimulate food intake and adiposity in rodents. Adipocyte-derived circulating leptin informs the hypothalamus of the state of fat stores, preventing food intake and further fat accumulation. In a study comparing schizophrenic patients using risperidone with a GAF score above 70 and healthy individuals, leptin levels were found to be higher in schizophrenic patients using risperidone (50). Although the association of antipsychotics with leptin elevation is known, there are conflicting results on the association between leptin and SCZ. Fortunately, a meta-analysis on that issue suggests that leptin levels are higher in the SCZ (51). In our study, leptin levels were significantly higher in the schizophrenic group compared to the healthy group, which supports this meta-analysis (Table 3).

The leptin and cholesterol levels were found to be low in patients with major depressive disorder but high in schizophrenic patients in a study. The results of that study also showed positive correla-

tions between serum cholesterol or leptin levels and the length of illness in schizophrenic patients. In the same study, plasma leptin levels were found to be higher in the schizophrenia group and lower in the major depressive group compared to the healthy group. The results of that study suggest that leptin may play a role in the pathophysiology of schizophrenia (52).

NOTCH is a critical signaling pathway in neurodevelopment and adult brain homeostasis. In a study (25), the activity of the Notch signaling pathway was investigated in bipolar disorder, schizophrenia, and healthy controls by measuring plasma levels of Notch ligands. That research found significantly higher Notch ligand levels in plasma in both SCZ and bipolar disorder compared to healthy controls, indicating that the Notch signaling pathway is impaired in both schizophrenia and bipolar disorder.

The relationship between NOTCH, leptin and SCZ as a mechanism can be summarized as follows based on the literature. Notch signal in adipocytes increases lipid accumulation, leading to enlargement of white adipose tissue (49). Adipocyte-derived leptin released into the circulation affects the hypothalamus in an inhibitory way against food intake (50). In light of this information, it can be deduced that the leptin molecule is released more in individuals with high adipocyte amounts. Both our study and the literature showed that leptin is higher in SCZ individuals than in healthy individuals (50-52). Unlike other studies, our study evaluated the relationship between NOTCH and leptin levels and body composition. According to our data, of these parameters, Notch, in particular, is closely related to body fat mass, fat percentage, and BMI. Leptin is a well-known metabolic hormone today and is directly proportional to the amount of fat in the body. In our study, the correlation of the leptin hormone with the scales used to measure the symptom severity of Schizophrenia patients, especially with positive symptoms such as delusions, conceptual disorganization, and excitement, suggests that this pathway may be one of the new therapeutic approaches in schizophrenia.

It is known that neuroinflammation has a crucial

role in the pathogenesis of schizophrenia (11). For this reason, although the level of IL-1 $\beta$ , which is a marker of inflammation, was expected to be high, it was found to be lower than the control group. The results of studies on this topic are conflicting. IL-1 $\beta$  exerts a pro-inflammatory effect by promoting leukocyte recruitment to areas of inflammation and/or activating inflammatory cells (53). In a study comparing schizophrenic patients and healthy individuals, IL-1 $\beta$  was not found to be statistically different between healthy individuals and people with schizophrenia (54). However, some publications also report that IL-1 $\beta$  changes significantly in people with schizophrenia. IL-1 $\beta$  levels measured by ELISA in plasma are found to be higher in schizophrenia patients than in controls (10). Contrary to many studies suggesting an increase in IL-1 $\beta$  levels, in a study Potvin et al. conducted in 2008, no significant change was detected in IL-1 $\beta$  levels in vivo and in vitro studies (53). No significant increase has been reported in chronic patients with disease duration longer than six years (55). A recent study found that IL-1 $\beta$  levels decreased in psychosis patients with a disease duration of less than two years, who had a first episode, and who did not use medication (FEDN) (56). In our study, we did not find any significant relationship between the age of the patients, duration of illness, duration of hospitalization, and total number of hospitalizations with hormonal levels. These findings contrast with expectations and previous research. Therefore, further investigation is warranted to elucidate the underlying mechanisms responsible for these contradictory results. Additional studies with larger sample sizes and more comprehensive methodologies may provide clarity on the factors influencing hormonal levels in relation to patient demographics and healthcare variables.

Our study results show a positive correlation between leptin and PANSS scores. Also, according to regression analyses, serum leptin level remained a significant predictor of the PANSS scale. A study reported that positive symptom severity inversely correlated with serum leptin levels in SCZ patients (57), but another study reported positive relations similar to our study (58). Although the results of the studies show a possible association between serum leptin levels and positive symptoms in schizophrenia, more research is needed to confirm

the findings and understand the underlying mechanism.

This study acknowledges several limitations that warrant attention. Among the most significant are the small sample size, absence of subgroups for different medications, hindering the ability to assess medication effects, and the inclusion of only male patients, which restricts the generalizability of the findings. Moreover, confounding factors such as gender, obesity, smoking, medication use, and waist circumference measurements, as well as infectious diseases affecting IL-1 $\beta$  levels, were not thoroughly addressed. Consequently, the observed associations may be influenced by these factors, making it difficult to determine their specific effects. To mitigate these limitations and derive more robust conclusions, future studies necessitate larger and more diverse samples, comprehensive medication usage data, and meticulous control of confounding variables.

This study showed the relationship between NOTCH and lipid metabolism in a clinical population. This study shows that NOTCH and the leptin IL-1 $\beta$  pathway (NILCO) are affected in schizophrenia patients. We found lower levels of IL-1 $\beta$  in schizophrenia patients than in controls. Additionally leptin levels predicted PANSS scores in our study suggesting that serum leptin levels can be associated with particularly positive symptoms in schizophrenia.

The relationship identified between body fat mass, fat percentage, BMI, and Notch in our study suggests a potential avenue worth further investigation. However, conducting additional research with meticulous control of confounding variables is imperative to validate and better understand these findings.

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# The relationship between childhood traumas and dysfunctional attitudes in individuals with unipolar depression

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## SUMMARY

**Objective:** This study aims to investigate the relationship between childhood trauma and dysfunctional attitudes in individuals diagnosed with unipolar depression.

**Method:** Two hundred patients diagnosed with unipolar depression were included in the study and comorbid diagnoses were determined with the help of a structured clinical interview (SCID-I) for DSM-IV axis-I disorders. Sociodemographic data form, Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Childhood Trauma Questionnaire (CTQ), and Dysfunctional Attitude Scale (DAS) were applied to the individuals included in the study.

**Results:** More than half (66,5%) of the individuals followed up due to unipolar depression had childhood trauma, the most common childhood trauma was emotional neglect (%57,5). While there was a positive correlation between DAS total score and physical neglect ( $p=0,027$ ,  $r=0,205$ ), emotional abuse( $p=0,007$ ,  $r=0,208$ ) and physical abuse ( $p=0,039$ ,  $r=0,124$ ) score, there was a positive correlation between DAS independent attitude and emotional neglect ( $p=0,044$ ,  $r=0,223$ ), physical neglect ( $p=0,007$ ,  $r=0,205$ ) and emotional abuse( $p=0,010$ ,  $r=0,173$ ), and a positive correlation between DAS perfectionism and emotional abuse( $p=0,010$ ,  $r=0,219$ ) and physical abuse ( $p=0,029$ ,  $r=0,139$ ). In the logistic regression analysis, in the age-adjusted model, it was determined that the number of depressive episodes in those with CTQ was 1.39 times ( $p=0.02$ , 95% CI= 1.04-1.85) higher than in those without CTQ.

**Discussion:** As far as we know, it is one of the rare studies in the literature examining the relationship between DAS subscales and childhood trauma subscales. It was found that physical and emotional neglect from childhood traumas was associated with the development of an independent dysfunctional attitude, and emotional and physical abuse was associated with the development of a perfectionist dysfunctional attitude. We believe that addressing cognitive distortions in the light of this information in the follow-up and treatment of these patients may contribute positively to treatment response and prognosis.

**Key Words:** Unipolar Depression, Childhood Trauma, Dysfunctional Attitudes

## INTRODUCTION

Depressive disorder is an important public health problem that can lead to work and social losses, including feeling sad, pessimistic, decreased interest in activities, lack of pleasure, hopelessness, guilt, worthlessness, thoughts of regret, impairment in psychophysiological functions such as attention, sleep and appetite, changes in psychomotor behaviors and sometimes recurrent thoughts of death (1). The one-year prevalence of depression was found to be 6.6%, while the lifetime prevalence was 16.2%. When analyzed by gender, the lifetime prevalence in males was 8-12%, whereas this rate was reported to be 20-26% in females (2).

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Child abuse and neglect is all of the actions or inactions directed towards the child by the mother, father or other caregivers who are obliged to take care of the child, which are characterized as inappropriate and damaging by the society or expert individuals and which prevent or restrict the development of the child in many areas. This situation is a public health problem that affects not only families but also social organizations, the education system, the legal order and the general society (3,4). Traumatic experiences in childhood may cause physical and mental problems in later life periods. In many studies, a relationship has been found between depressive disorder and childhood traumas. A history of childhood neglect or abuse

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has been associated with an increase in the duration of depressive illness, the risk of self-murder and the likelihood of recurrence of depression (5,6).

According to Beck, beliefs and cognitions play an important role in the development of depression and dysfunctional attitudes are used to describe these cognitive processes in depressed individuals. Dysfunctional attitudes are shaped as a result of close relationships and intra-family relationships starting from early childhood and can contribute to the development of depression by becoming active with negative life events (7). Childhood trauma is an important early social risk factor for the development of depressive disorder and dysfunctional attitudes may mediate the effect of childhood trauma on the onset of depression (8).

The hypothesis of this study is that patients with unipolar depression who applied to our university psychiatry outpatient clinic between February 2019 and January 2020 have more dysfunctional attitudes than those without childhood trauma. In the light of this information, our study focused on the mediating role of dysfunctional attitudes between depression and childhood traumas and aimed to investigate the relationship between the subscales of the dysfunctional attitudes scale and the subscales of childhood traumas in these individuals. In addition, it was aimed to compare the sociodemographic data of depressed individuals with childhood trauma with those without childhood trauma and to determine whether there were any differences between the two groups in terms of age at onset, duration, frequency of depressive episodes, self-murder attempts, thoughts of self-murder and family history of psychiatric illness.

## METHODS

### Sample

The sample of the study consisted of 200 patients diagnosed with unipolar depression who applied to the psychiatry outpatient clinic of our university medical faculty hospital between February 2019 and January 2020. In our study, no sample calculation was made and all patients who applied to the

outpatient clinic between the relevant dates and met the inclusion criteria were included in the study.

Patients who were followed up for unipolar depression, between the ages of 18-65, volunteered to participate in the study, gave signed consent, agreed to fill out the scales, were literate, and did not have intellectual disability were included in the study.

This study was approved by the Clinical Research Ethics Committee of the Faculty of Medicine of our university with the decision dated 23.01.2019 and protocol no. 2019-10-23/01.

The purpose of the study was explained to the participants who agreed to participate in the study by the physician who conducted the clinical interview and their consent was obtained, the sociodemographic data form was filled out and information was given on how to fill out the scales.

### Data Collection Tools

After the sociodemographic data form of 200 patients diagnosed with unipolar depression was completed by the researcher, the patients were asked to complete the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Childhood Traumas Scale (CTS) and Dysfunctional Attitudes Scale (DAS). In addition, a Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I) was conducted by the researcher to find out the current and past psychiatric disorders of the patients participating in the study. The Turkish reliability and validity study of SCID-I was conducted by Çorapçıoğlu et al. (9).

*Sociodemographic Data Form:* In the form developed in accordance with the literature, sociodemographic and clinical information such as age, gender, educational status, marital status, occupation, cohabitants, place of residence, whether there is a known psychiatric illness in the family, if any, type of illness, age at the onset of the first depressive episode, duration of the last depressive episode, treatments used, history of self-harm attempt, income level were questioned. This form was com-

pleted by the researcher after the interview with the patient.

*Beck Depression Inventory:* The Turkish validity and reliability study of the Beck depression inventory developed by Beck in 1961 was conducted by Hisli Şahin in 1988. This inventory, which can be used to determine the risk of depression and to measure the severity and level of the disease, consists of 21 self-assessment sentences (10). Each question in the four-point Likert scale receives 0, 1, 2 or 3 points and the total score varies between 0-63. The cut-off score was determined as 17 in the validity and reliability study. As the score obtained from the scale increases, the severity of depression also increases (11).

*Beck Anxiety Inventory:* The Turkish validity and reliability of the Beck Anxiety Inventory, which was developed by Beck et al. in 1988 to measure the severity of anxiety symptoms experienced by the person, was conducted by Ulusoy et al. in 1998. This scale consists of 21 items and is a 4-point Likert scale. Each item in the scale receives a score between 0-3 points and the total anxiety score can vary between 0-63. As the score on the Beck anxiety scale increases, the severity of anxiety also increases (12).

*Childhood Traumas Scale:* The Childhood Traumas Scale (CTS) was first developed by Bernstein et al. in 1994 with 70 items, but the number of items used in this scale was reduced over time and it was adapted into Turkish by Şar et al. in 1996 (13). This scale, which is used to screen abuse and neglect experiences of individuals before the age of 20, is based on self-report and is a 5-point Likert-type scale. In our study, the 28-item short form of the scale was used and in this form, the presence or absence of physical and emotional neglect and physical, sexual and emotional abuse in childhood was evaluated. The response options for each item in the scale are as follows; 1: never, 2: rarely, 3: occasionally, 4: frequently, 5: very frequently and each item is scored between 1-5.

With the CTS used in our study, childhood sexual, physical, emotional abuse and physical and emotional neglect can be calculated as five sub-scores

separately, or a total score consisting of a combination of these can be calculated. While the sub-scores range from 5 to 25, the total CTS score ranges from 25 to 125. In Turkey, the cut-off scores for the CTS were determined as exceeding 5 points for sexual and physical abuse, exceeding 7 points for emotional abuse and physical neglect, and exceeding 12 points for emotional neglect. This limit was determined as 35 points for the total CTS score (13).

*Dysfunctional Attitudes Scale:* The Dysfunctional Attitudes Scale (DAS) was developed by Beck and Weismann on the basis of cognitive theory and is used to measure an individual's negative attitudes towards self, the outside world and the future. With this scale, it is aimed to evaluate the structural 'intermediate beliefs' between cognitive schemas and automatic thoughts (14). In addition, DAS can be used to differentiate depressive patients from groups with other mental illnesses, to identify individuals who are cognitively predisposed to depression, to find the risk of recurrence of the disease, to predict treatment response and to determine attitudes that change with treatment (15).

The DAS is a self-report scale consisting of a total of 40 items to assess dysfunctional attitudes, each of which is scored between 1-7. The score range of DAS is between 40-280, and a high score on the scale is associated with a high number of dysfunctional attitudes. The study on the validity and reliability of the scale in Turkey was conducted by Şahin and Şahin and it was found that the scale consists of 4 subscales: 'perfectionist attitude', 'need for approval', 'independent attitude' and 'variable attitude'. 18 items (1, 3, 4, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 20, 25, 26, 31, 33) represent perfectionist attitudes of the individual, 11 items (19, 21, 22, 23, 27, 28, 32, 34, 38, 39, 40) represent the individual's need for environmental approval, The 6-item independent attitude (2, 12, 17, 18, 24, 35) refers to the individual's independence from environmental approval needs, and the 5-item variable attitude (6, 29, 30, 36, 37) refers to the individual's flexible attitudes (16). In our study, it was aimed to determine the therapeutic intervention areas by calculating the scores obtained from the subscales as well as the total score.



## Statistical Analysis

Statistical evaluation was performed using PASW (Predictive Analytics SoftWare) program. The compatibility of numerical variables with normal distribution was analyzed by Shapiro-Wilk test. Descriptive statistics were expressed as arithmetic mean  $\pm$  standard deviation and median (minimum-maximum) for numerical variables and as number and percentage for verbal data. Differences between the groups in terms of verbal variables were analyzed by Pearson Chi-square, Yates Chi-square and Fisher Exact tests. In the comparison of two groups in terms of numerical variables, the significance test of the difference between two means was used when the parametric test assumptions were met, and the Mann-Whitney U test was used when they were not met. The linear relationship

between two numerical variables was analyzed by Pearson correlation analysis if parametric test assumptions were met, and by Spearman correlation analysis if not. Logistic regression analysis was performed for the variables as further analysis and  $p < 0.05$  was considered significant for all evaluations.

## RESULTS

The study included 200 patients with a diagnosis of depression. Of the participants, 80% (160) were female, 40.5% (81) were primary school graduates, 64% (128) were married, and 51.5% (103) were unemployed/housewives. The ages of the participants ranged between 18 and 65 years, with a mean age of  $40.5 \pm 11.9$  years (Table 1). Sociodemographic characteristics and disease-

**Table 1.** Comparison of sociodemographic characteristics between those with and without childhood trauma

		Childhood Trauma n=133	Without Childhood Trauma n=67	Total	P
		n(%)	n(%)	n(%)	
Gender	Female	103 (%77,4)	57 (%85,1)	160 (%80)	0,277 <sup>1</sup>
	Male	30 (%22,6)	10 (%14,9)	40 (%20)	
Education Level	Primary school	60 (%45,1)	21 (%31,3)	81 (%40,5)	0,047 <sup>1*</sup>
	Secondary school	16 (%12,0)	5 (%7,5)	21 (%10,5)	
	High school	30 (%22,6)	16 (%23,9)	46 (%23)	
	College/university graduate	27 (%20,3)	26 (%37,3)	52 (%26)	
Marital status	Married	88 (%66,2)	40 (%59,7)	128 (%64)	0,139 <sup>1</sup>
	Single	26 (%19,5)	21 (%31,3)	47 (%23,5)	
	Divorced- widow	19 (%14,3)	6 (%9,0)	25 (%12,5)	
Job	Unemployed/housewife	70 (%52,6)	33 (%49,3)	103 (%51,5)	0,560 <sup>1</sup>
	Worker/ civil servant/ employee	35 (%26,3)	22 (%32,8)	57 (%28,5)	
	Student	16 (%12,0)	9 (%13,4)	25 (%12,5)	
	Retired	12 (%9,0)	3 (%4,5)	15 (%7,5)	
People he/she lives with	With his wife and children	86 (%64,7)	37 (%55,2)	123 (%61,5)	0,504 <sup>1</sup>
	With parents	16 (%12,0)	14 (%20,9)	30 (%15)	
	Alone	14 (%10,5)	8 (%11,9)	22 (%11)	
	Large family	11 (%8,3)	6 (%9,0)	17 (%8,5)	
Place of residence	With friends	6 (%4,5)	2 (%3,0)	8 (%4)	0,425 <sup>1</sup>
	Province	57 (%42,9)	28 (%41,8)	85 (%42,5)	
	District	61 (%45,9)	35 (%52,2)	96 (%48)	
	Village	15 (%11,3)	4 (%6,0)	19 (%9,5)	
Level of income	Income less than expenses	86 (%64,7)	40 (%59,7)	126 (%63)	0,679 <sup>1</sup>
	Income equals expenses	40 (%30,1)	22 (%32,8)	62 (%31)	
	Income more than expenses	7 (%5,3)	5 (%7,5)	12 (%6)	
Thoughts of suicide	Yes	56 (%42,1)	24 (%35,8)	80 (%40)	0,392 <sup>1</sup>
	No	77 (%57,9)	43 (%64,2)	120 (%60)	
Attempted suicide	Yes	13 (%9,8)	3 (%4,5)	16 (%8)	0,304 <sup>1</sup>
	No	120 (%90,2)	64 (%95,5)	184 (%92)	
Comorbid psychiatric disorder	Yes	59 (%44,4)	33 (%49,3)	92 (%46)	0,512 <sup>1</sup>
	No	74 (%55,6)	34 (%50,7)	108 (%54)	

	Median(min-max)	Median (min-max)	Median(min-max)	
Age	42 (18-65)	38 (19-65)	40,5 (18-65)	0,038 <sup>2*</sup>
Age of onset of depression	35 (14-65)	32 (17-61)	33,6 (14-65)	0,285 <sup>2</sup>
Duration of depression (in last illness) (months)	24 (1-420)	24 (1-360)	53,3 (1-420)	0,491 <sup>3</sup>
Number of previous attacks	2 (1-10)	1 (1-6)	2,1 (1-10)	0,003 <sup>3*</sup>
Time without treatment (months)	6 (1-180)	8 (1-84)	13,7 (1-180)	0,048 <sup>3*</sup>
Duration of last regular treatment (months)	12 (1-108)	7,5 (1-84)	17,9 (1-108)	0,151 <sup>3</sup>
Number of suicide attempts	0 (0-4)	0 (0-3)	0,3 (0-4)	0,061 <sup>3</sup>
Number of hospitalizations	2 (1-10)	1 (1-3)	2,3 (1-10)	0,117 <sup>3</sup>

<sup>1</sup>Ki kare, <sup>2</sup>Two sample t test, <sup>3</sup>Mann-Whitney U, \* $p < 0,05$ .

**Table 2.** Comparison of the scale scores of those with and without childhood trauma in groups

	Childhood Trauma n=133	Without Childhood Trauma n=67	p
	Median (Min Maks)	Median (Min Maks)	
BDI	26,0 (0-52)	20,0 (0-43)	0,024*
BAI	22,0 (0-61)	21,0 (0-49)	0,233
DAS T	134,0 (61-251)	131,0 (76-230)	0,315
DAS- PA	51,0 (21-109)	50,0 (24-106)	0,727
DAS-NA	41,0 (12-70)	40,0 (11-67)	0,540
DAS -IA	24,0 (6-41)	21,0 (10-35)	0,080
DAS- VA	19,0 (5-31)	18,0 (9-26)	0,593

Mann-Whitney U test was used. \*p<0,05. BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, DAS T: Dysfunctional Attitudes Scale Total score, DAS PA: Dysfunctional Attitudes Scale Perfectionist Attitude, DAS NA: Dysfunctional Attitudes Scale Need for Approval DAS IA: Dysfunctional Attitudes Scale Independent Attitude DAS VA: Dysfunctional Attitudes Scale Variable Attitude

related descriptive characteristics of the participants with and without childhood trauma are given in Table 1.

The mean age at onset of depression was  $33.6 \pm 11.3$  years, although the age of onset ranged between 14 and 65 years in these individuals who were followed up for depression. The duration of the current illness was between 1 month and 420 months with a mean of  $53.3 \pm 75.2$  months. The number of previous episodes of depression ranged between 1 and 10 (mean  $2.1 \pm 1.4$ ) (Table 1).

In the last depressive episode, 40% of the participants (80 people) had thoughts of killing themselves, while 8% (16 people) had attempted to kill themselves. In general, when all previous depressive episodes were considered, those who attempted to kill themselves constituted 20% of the participants (40 people). 61.5% of the participants had a family history of psychiatric illness (Table 1).

Co-diagnoses were determined with the Structured Clinical Interview for DSM-IV Axis-I Disorders (SCID-I) applied to these individuals who were followed up for depression. Accordingly, 46% of the participants (92 individuals) had comorbid psychiatric disorders. The most common comorbidity was anxiety disorder not otherwise specified with 25.5% (51 people). In addition, 8% (16 people) had panic disorder, 4.5% (9 people) had somatoform disorder, 2.5% (5 people) had generalized anxiety disorder, 2% (4 people) had alcohol abuse, 1.5% (3 people) had obsessive-compulsive disorder, 1.5% (3 people) had posttraumatic stress disorder, and 0.5% (1 person) had eating disorder.

Regarding the medications used by the partici-

pants, 81% (162 people) were using psychiatric medication while 19% (38 people) were not using any medication. Antidepressants were used by 80% (160 people), benzodiazepines by 20.5% (41 people) and antipsychotics by 17% (34 people).

While 66.5% (133 people) of the participants had childhood trauma, 57.5% (115 people) had emotional neglect, 56.5% (113 people) had physical neglect, 45% (90 people) had emotional abuse, 32.5% (65 people) had physical abuse, and 21% (42 people) had sexual abuse. Among the participants, 29% (58 people) were not neglected, 28% (56 people) were exposed to only one of physical or emotional neglect, and 43% (86 people) were exposed to both physical and emotional neglect. In addition, 29.5% (59 people) had experienced only one of physical, emotional or sexual abuse, 21% (42 people) had experienced both types of abuse, and 9% (18 people) had experienced both physical, emotional and sexual abuse.

The sociodemographic characteristics of those with childhood trauma (CT) (66.5%-1133) and those without (33.5%-567) were analyzed. The mean age was higher ( $p=0.038$ ) and the mean duration of education was lower ( $p=0.047$ ) in those with childhood trauma (Table-1). No statistically significant difference was found between the groups with and without CT in terms of gender ( $p=0.277$ ), marital status ( $p=0.139$ ), employment status ( $p=0.560$ ), cohabitants ( $p=0.504$ ), place of residence ( $p=0.425$ ), and income level ( $p=0.679$ ) (Table 1).

Table 1 shows that the number of previous depressive episodes ( $p=0.003$ ) was higher and the duration of treatment-free period ( $p=0.048$ ) was shorter in the group with CT compared to the group without CT. No significant statistical difference was

**Table 3.** Comparison of the subscale scores of the CT with the subscales of the BDI, BAI and DAS

		BDI	BAI	DAS-PA	DAS -NA	DAS -IA	DAS -VA	DAS- T
Emotional neglect n=115 (%57.5)	Median (Min Maks)	26,0 (0-52)	23,0 (0-61)	51,0 (21-109)	42,0 (14-70)	24,0 (6-41)	19,0 (5-31)	135,0 (61-251)
No emotional neglect n=85 (%42.5)	Median (Min Maks)	21,0 (0-43)	19,0 (0-54)	50,0 (24-106)	40,0 (11-67)	21,0 (10-35)	18,0 (9-26)	130,0 (74-230)
	p	0,056	0,105	0,771	0,454	0,044*	0,675	0,358
Physical neglect n=113 (%56.5)	Median (Min Maks)	26,0 (0-52)	23,0 (0-61)	54,0 (23-99)	42,0 (12-68)	24,0 (7-37)	20,0 (5-30)	142,0 (61-215)
Without physical neglect n=87 (%43.5)	Median (Min Maks)	20,0 (0-48)	16,0 (0-49)	49,0 (21-109)	40,0 (11-70)	21,0 (6-41)	17,0 (9-31)	17,0 (64-251)
	p	0,042*	0,012*	0,104	0,517	0,007*	0,178	0,027*
Emotionally abused n= 90 (%45)	Median (Min Maks)	28,0 (1-52)	23,5 (0-61)	55,0 (21-109)	42,5 (12-70)	24,0 (7-41)	18,0 (7-31)	142,5 (64-251)
Not emotionally abused n=110 (%55)	Median (Min Maks)	20,0 (0-43)	16,0 (0-53)	49,0 (24-106)	40,0 (11-68)	21,0 (6-37)	19,0 (5-30)	129,0 (61-230)
	p	0,0001*	0,011*	0,010*	0,074	0,010*	0,553	0,007*
Physically abused n=65 (%32.5)	Median (Min Maks)	28,0 (1-52)	26,0 (0-61)	55,0 (21-99)	43,0 (18-64)	24,0 (6-37)	18,0 (7-29)	144,0 (64-210)
Not physically abused n=135 (%67.5)	Median (Min Maks)	21,0 (0-46)	19,0 (0-54)	49,0 (24-109)	40,0 (11-70)	21,0 (7-41)	19,0 (5-31)	130,0 (61-251)
	p	0,003*	0,005*	0,029*	0,109	0,957	0,824	0,039*
Sexually abused n=42 (%21)	Median (Min Maks)	26,5 (2-52)	21,0 (0-61)	52,5 (21-99)	41,0 (14-64)	24,0 (8-37)	17,5(11-30)	134,0 (84-210)
Not sexually abused n=158 (%79)	Median (Min Maks)	22,0 (0-48)	21,5 (0-54)	50,0 (23-109)	41,0 (11-70)	21,0 (6-41)	19,0 (5-31)	132,5 (61-251)
	p	0,198	0,970	0,621	0,846	0,246	0,739	0,618

Mann-Whitney U test was used. \*p<0,05. CT: Childhood trauma . BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, DAS T: Dysfunctional Attitudes Scale Total score DAS PA: Dysfunctional Attitudes Scale Perfectionist Attitude, DAS NA: Dysfunctional Attitudes Scale Need for Approval DAS, IA: Dysfunctional Attitudes Scale Independent Attitude DAS VA: Dysfunctional Attitudes Scale Variable Attitude

found between the groups with and without CT in terms of age at onset of depression ( $p=0.285$ ), duration of the last episode ( $p=0.491$ ), duration of the last regular treatment ( $p=0.151$ ), number of self-murder attempts ( $p=0.061$ ), number of hospitalizations ( $p=0.117$ ), thoughts ( $p=0.392$ ) and attempts ( $p=0.304$ ) of self-murder during the last illness (Table-1).

No significant statistical difference was found between the groups with childhood trauma and the groups without CT in terms of BDI ( $p=0.233$ ), DAS total score ( $p=0.315$ ) and subscores (Table-2). Only the mean score of the BDI was found to be statistically significantly higher in those with CT compared to those without CT ( $p=0.024$ ) (Table 2).

Using the cut-off scores of the subscale scores of the childhood traumas scale, the groups were divided into two groups as with and without physical and emotional neglect/abuse and sexual abuse and comparisons were made between the groups in terms of scale scores. The independent attitude subscale score of the DAS was found to be significantly higher in those with emotional neglect (EN) (57.5%-115 participants) compared to those without emotional neglect (42.5% 5-85 participants) ( $p=0.044$ , Table 3).

It is seen in Table 3 that the scores of the BDI ( $p=0.042$ ), BAI ( $p=0.012$ ), total score of the DAS ( $p=0.027$ ), and independent attitude subscale scores of the DAS ( $p=0.007$ ) were higher in those with physical neglect (PN) (56.5%-113 persons) compared to those without (43.5%-587 persons).

It was found that those who were exposed to emotional abuse (EA) (45-90%) had significantly higher scores on the BDI ( $p<0.001$ ), BAI ( $p=0.011$ ), total score of the DAS ( $p=0.007$ ), perfectionist attitude of the DAS ( $p=0.010$ ), and independent attitude of the DAS ( $p=0.010$ ) subscale scores than those who were not exposed to EA (55-110%) (Table 3).

The BDI ( $p<0.003$ ), BAI ( $p=0.005$ ), DAS total score ( $p=0.039$ ), and DAS perfectionist attitude ( $p=0.029$ ) subscale scores were found to be significantly higher in those with physical abuse (32.5-65%) compared to those without (67.5-135%) (Table-3).

There was no significant difference between those who had been exposed to sexual abuse (SA) (21-42%) and those who had no history of SA (79-158%) in terms of scale scores (Table 3).

The relationships between the total and subscale

**Table 4.** Correlations associated with scale scores

Spearman's Rho	Emotional Abuse	Physical Abuse	Physical Neglect	Emotional Neglect	Sexual Abuse	Total CTS	BDI	BAI	DAS-PA	DAS-NA	DAS-IA	DAS-VA
r	r	r	r	r	r	r	r	r	r	r	r	r
Emotional Abuse	-											
Physical Abuse	0,521***	-										
Physical Neglect	0,370***	0,401***	-									
Emotional Neglect	0,492***	0,440***	0,615***	-								
Sexual Abuse	0,254***	0,182**	0,145*	0,179*	-							
Total CTS	0,735***	0,616***	0,747***	0,878***	0,355***	-						
BDI	0,283***	0,200**	0,149*	0,141*	0,90	0,236***	-					
BAI	0,204**	0,192**	0,195**	0,157*	0,016	0,225***	0,609***	-				
DAS-PA	0,219**	0,139*	0,159*	0,019	0,031	0,139	0,320***	0,256***	-			
DAS-NA	0,128	0,098	0,144*	0,060	0,004	0,108	0,279***	0,227***	0,705***	-		
DAS-IA	0,173*	0,015	0,205**	0,223**	0,099	0,238***	0,186**	0,169*	0,218**	0,261***	-	
DAS-VA	-0,057	-0,013	0,091	0,063	-0,057	0,032	0,125	0,095	0,219**	0,295***	0,383***	-
DAS-T	0,208**	0,124	0,205**	0,097	0,034	0,182**	0,339***	0,280***	0,908***	0,858***	0,455***	0,435***

r: Spearman korelasyon katsayısı. \*\*\*p<0,001, \*\*p<0,01, \*p<0,05. BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, DAS T: Dysfunctional Attitudes Scale Total score, DAS PA: Dysfunctional Attitudes Scale Perfectionist Attitude, DAS NA: Dysfunctional Attitudes Scale Need for Approval, DAS IA: Dysfunctional Attitudes Scale Independent Attitude, DAS VA: Dysfunctional Attitudes Scale Variable Attitude, CTS: Childhood Trauma Scale

scores of the BDI, BAI, dysfunctional attitudes and childhood traumas scale were shown in Table-4. A weak positive correlation was found between the scores of emotional neglect and the scores of the independent attitude subscale of the BDI, BAI, and DAS ( $p<0.05$ , Table 4). There was a weak positive correlation between the physical neglect scores and the total scores of BDI, BAI, DAS, and DAS perfectionist attitude, DAS need for approval, and DAS independent attitude subscale scores ( $p<0.05$ , Table 4). A weak positive correlation was found between emotional abuse scores and total scores of BDI, BAI, DAS and subscale scores of perfectionist attitude of DAS and independent attitude of DAS ( $p<0.05$ , Table 4). A weak positive correlation was found between the physical abuse scores and the BDI, BAI and DAS perfectionist attitude subscale scores ( $p<0.05$ , Table 4).

As a result of binary logistic regression analysis including age, gender and marital status as confounding factors, no statistically significant difference was found between the total score and subscale scores of the BDI, BAI, dysfunctional attitudes and childhood traumas scale included in the correlation analysis and depression in remission and moderate-severe depression groups.

Since the mean age and number of depressive episodes were found to be high in patients with CT, logistic regression analysis was performed to examine the effect of these variables. In the logistic regression analysis, it was found that the number of previous depressive episodes was 1.39 times ( $p=0.02$ , 95% CI=1.04- 1.85) higher in the age-adjusted model in patients with CT compared to those without CT.

## DISCUSSION

In our study, it was found that those with childhood trauma comprised more than half of the sample (66.5%), had a higher number of previous depressive episodes, higher depression severity scores and were less educated.

Child abuse and neglect is an important public health problem and has been associated with psychiatric diseases in many long-term studies (2). In our study, it was found that two thirds of the patients followed up for depression had childhood trauma. The most common CT was emotional neglect, followed by physical neglect, emotional abuse, physical abuse and sexual abuse, respectively.

In a study by Bülbül F et al. it was found that when patients with recurrent depression were compared with the first episode depression group, their childhood trauma scores were higher and their illnesses started at an earlier age (17). In our study, no difference was found in the age of onset unlike the literature. On the other hand, both the number of previous depressive episodes and the mean age were found to be higher in those with a history of childhood trauma. Statistical analysis was performed to investigate the effect of age and the presence of CT on the risk of having a depressive episode. In the logistic regression analysis, when age was standardized, it was found that the number of previous depressive episodes was 1.36 times higher in those who had a history of CT compared to those who did not, and the presence of childhood trauma increased the likelihood of recurrence of depression. In a study of 2288 individuals with depression and anxiety disorders in the Netherlands, emotional neglect was found to be



particularly associated with depressive disorder, dysthymia and social phobia. In the same study, it was found that those with a history of emotional neglect and sexual abuse had a higher lifetime risk of developing more than one affective disorder (18). However, a few studies reporting the opposite view have reported that adversities experienced at an early age have a protective effect against the development of depression and anxiety in adulthood (19,20). In our study, the most common comorbidity among comorbidities in patients with depression was anxiety disorder not otherwise specified. However, no significant difference was found in terms of comorbidities in cases with and without childhood trauma.

Although it varies according to regions in Turkey, it has been shown that sexual abuse is observed with a rate of 10-53% and 30% of this rate occurs between the ages of 2-5 years and 40% between the ages of 6-10 years (21). In our study, in accordance with the literature, those who were sexually abused were approximately one fifth of the depressed individuals who participated in the study. In our study, the rate of those with at least one type of neglect was 28% and two types of neglect was 43%, while the rate of those exposed to one type of abuse was 29.5%, two types of abuse was 21% and three types of abuse was 9%. These results show that children who are exposed to any type of neglect or abuse become vulnerable to other types of neglect and abuse, and that these individuals experience many dimensions of abuse together.

Dysfunctional attitudes observed in depressed individuals are one of the important parts of the cognitive structure and play a fundamental role in the formation of cognitive distortions. Childhood traumas may mediate the development of dysfunctional attitudes through their effects on the formation of schemas and increase the susceptibility to psychopathology, especially to the development of depression (22,23). The perfectionist attitude of the DAS is associated with worrying about being criticized and negatively evaluated by others and evaluating the slightest mistakes and deficiencies as inadequacy and incompetence. While need for approval is related to the fact that one's self-worth depends on love, approval and support from others, independent attitude is related to the fact that

one is independent from environmental approval needs. The last subscale, the DAS variable attitude, includes the flexible attitudes of the individual (24,25). In our study, a positive correlation was found between the scores of the emotional neglect and physical neglect subscales of the CTS and the independent attitude of the DAS. Based on these findings, it can be thought that emotional and physical neglect leads to a decrease in the need for approval from other people and a decrease in the need for bonding with people as a result of individuals growing up in an environment where their needs are not constantly met. The weakening of social ties as a result of this attitude may also mediate depression. The high level of perfectionist dysfunctional attitudes in individuals who experienced emotional and physical abuse in our study may be related to the fact that they try to avoid being criticized, blamed and punished by not making mistakes, doing everything completely, focusing on their own responsibilities in every event and trying to correct them. In addition, a significant correlation was also found between the emotional abuse score of the CTS and the independent attitude of the DAS. In a study conducted in China, exposure to more childhood trauma was associated with more dysfunctional attitudes in individuals with depression. In addition, emotional abuse and physical neglect among childhood trauma subscales were found to be more associated with dysfunctional attitudes (26). This result is similar to other studies in the literature supporting the positive relationship between emotional neglect and dysfunctional attitudes in individuals diagnosed with depression (27). In addition, in our study, depression and anxiety scale scores were found to be higher in those who were exposed to emotional abuse, physical neglect or abuse in childhood. This is consistent with literature studies. In a study conducted in Eskişehir (62 patients with depressive disorder, 8 patients with dysthymic disorder, 50 healthy controls), a significant correlation was found between the BDI score and the DAS score and the emotional abuse and neglect score of the CTS, and it was reported that dysfunctional attitudes developed in women, especially with exposure to emotional abuse, and thus people became more prone to depression (28). In our study, no significant correlation was found between the sexual abuse subscale score of the CTS and the subscale scores of the

BDI, BAI and DAS. This may be related to the low number of patients reporting sexual abuse, or it may be related to the fact that emotional abuse in childhood is more traumatizing than sexual abuse, contrary to popular belief.

In our study, there was a significant positive correlation between depression and anxiety scale scores and all subscale scores except the total score of the DAS and variable attitude. Some of the patients who participated in our study had depression in remission under treatment, while others had depression with active symptoms. Logistic regression analysis was performed to examine whether dysfunctional attitudes and CTS scale scores were different between depression in remission and moderate to severe depression groups, and no statistically significant difference was found. Based on this finding, it can be thought that dysfunctional attitudes are not caused by depression, but rather a factor that causes depression. This finding supports the role of dysfunctional attitudes in the formation of depression and anxiety in line with the literature.

The presence of any dysfunctional attitude, especially perfectionist attitude and need for approval, was positively correlated with other subscale scores. Based on this finding, it can be said that the presence of any dysfunctional attitude may play a facilitating role for other dysfunctional beliefs and attitudes.

### Limitations of the Study

The fact that we used self-report-based scales in our study constitutes a limitation. In particular, there is a risk that self-report of sexual abuse in the scale used in our study is lower than it actually is as a result of embarrassment, fear and social prejudices.

Childhood trauma was present in more than half (66.5%-133%) of the individuals who were followed up for unipolar depression. The most common CTS was emotional neglect, followed by physical neglect, emotional abuse, physical abuse and sexual abuse, respectively. Being exposed to any childhood trauma in depressed individuals increases the likelihood of being subjected to other abus-

es and neglect. Having any dysfunctional attitude also increases the likelihood of having other dysfunctional attitudes. The presence of childhood trauma increased the likelihood of recurrence of depression by 1.39 times.

To the best of our knowledge, our study is one of the rare studies in the literature examining the relationship between the subscales of the DAS and the subscales of the CT. In particular, physical and emotional neglect among childhood traumas was found to be associated with the development of independent dysfunctional attitude, while emotional and physical abuse was found to be associated with the development of perfectionist dysfunctional attitude. We think that addressing cognitive distortions in the follow-up and treatment of these patients in the light of this information may contribute positively to treatment response and prognosis.

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# The effect of mothers' pathological internet use and psychopathology on children's pathological internet use

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## SUMMARY

**Objective:** This study aimed to examine the mediating role of psychological symptoms of mothers in the relationship between pathological internet use (PIU) of mothers of preschool children and PIU of their children.

**Method:** 283 mothers residing in Istanbul and having children aged 4-5 years participated in the research. Within the scope of the research, mothers' pathological internet use was evaluated with the Young Internet Addiction Scale, mothers' symptom levels were evaluated with the Symptom Screening Test, and children's pathological internet use level was evaluated with the Family-Child Internet Addiction Scale.

**Results:** When the time the child spends on technological devices is controlled, there is a significant relationship between mothers' pathological internet use and their children's pathological internet use. Mothers' symptoms including obsessive-compulsive ( $b=.14$ , 95% CI [.01,.29],  $p<.001$ ), interpersonal sensitivity ( $b=.12$ , 95% CI [.01,.26],  $p<.01$ ) and paranoid thoughts ( $b=.13$ , 95% CI [.02,.26],  $p<.001$ ) have a partial mediating role.

**Discussion:** Mothers' pathological internet use level and psychopathological symptoms have an effect on children's pathological internet use level. It is thought that pathological internet usage behaviors of mothers can be a role model for children and various psychological symptoms of mothers can strengthen this situation. As part of future studies, it is recommended to plan studies that include fathers or evaluate internet usage in detail.

**Key Words:** Pathological internet use, childhood, mother-child relationship, psychopathological symptom, internet addiction.

## INTRODUCTION

The preschool period is recognized as part of the early childhood stage. This stage represents a developmental process that forms the basis of human life. This period is characterized as a critical stage in which the child's physical, mental, social, emotional and language development is intense (1). In the preschool period, the family is of great importance for children; in this process, children are in a strong relationship with their parents and other family members. They use various strategies to reinforce children's positive behaviors and correct their negative behaviors (2). In this way, children's positive behavioral skills are expected to increase and negative behaviors are expected to decrease.

Behavioral patterns acquired in this period have reflections that can be seen in adulthood. Therefore, preschool children's relationship with their caregivers is more critical than in other periods. Psychological problems of parents may prevent communication with their children. It is known that family members expose their children to more technological devices when the child is not given enough attention or time (3). In a study conducted by Yengil et al. (2019), 59.8% of mothers reported using technological devices for social media and 49.5% for personal needs. In addition, it was determined that 57.1% of the participant mothers used technological devices for 0-1 hour, 28.5% for 1-2 hours, 11.9% for 2-3 hours and 2.4% for more than 3 hours a day (4). In Doğan and Döğler's (2023) study, it was reported that 56.1% of mothers used technology between 0-2 hours and

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20.6% between 2-4 hours a day (5).

In studies, it has been observed that intensive internet use in children and adolescents may cause problems in self-identity development, difficulties in social relationships and academic success in the future (6,7,8). In other studies, significant correlations were found between pathological symptoms from parents and Internet use by young people (8,9,10,11). For example, Lam L.T. (2015) found a significant relationship between the level of depression in mothers and pathological internet use in children (8). In another study conducted by Lam L.T. (2020), it was observed that children's mental health and parental internet use mediated the relationship between parental mental health and children's internet addiction (9). Park et al. (2008) found a relationship between communication within the family and Internet addiction in children (10). In a study conducted in the Netherlands, it was found that strong communication within the family regarding internet use prevented children from developing compulsive internet behavior (11). Although the studies conducted in this context in our country are limited, according to TUIK data, the rate of internet use among children aged 6-15 years increased from 50.8% in 2013 to 82.7% in 2021. When analyzed by gender, it was observed that the rate of use by boys increased from 53.7% in 2013 to 83.9% in 2021, while that of girls increased from 47.8% to 81.5% (12). It is thought that this increase may be associated with pathological internet use if not directed correctly.

As a result, this study aims to evaluate the mediating role of mothers' pathological symptoms (interpersonal sensitivity, hostility, somatization, anxiety, obsession, depression, psychotic, paranoid and phobic symptoms) in the relationship between mother's pathological internet use (PIU) and child's pathological internet use. The hypothesis of the study is "it is thought that mother's psychopathological symptoms may have a mediating effect on the significant relationship between mother's PIU level and child's PIU level." In addition, by focusing on preschool children's technology use, it aims to evaluate the relationship between mothers' technology use and their children's internet use. The data obtained in this way aims to fill the gap in the literature on this subject and to pro-

vide a basis for identifying groups of young children at risk before the development of pathological internet use.

## METHOD

### Sample

The sample consisted of 283 mothers with children aged between 4 and 5 years. The targeted total number of participants was found to be 250 using the G Power 3.1.9.2. program, with a reliability rate of .95, alpha error of .05 and effect size of .07 for multiple linear regression analysis (13, 14). It was aimed to work with a minimum of 280 mothers to prevent data loss. The inclusion criteria for the study were that the participants were over 18 years of age, had at least one child and the age of the children was between 4 and 5 years. Accordingly, the exclusion criteria were that the participants were younger than 18 years of age, did not have children, and their children were younger than 4 or older than 5 years of age. One participant did not answer more than 25% of the scale questions; the total scores of the participant were compared with the participants who answered the questions and no significant difference was found ( $p=.78$ ). For this reason, she was not included in the analysis and the study was completed with 282 mothers. Demographic information about the participants is presented in Table 1.

### Data Collection Tools

*Symptoms Distress Check List (SCL-90-R)*: This scale is used to determine the psychopathological symptoms of individuals (15). The inventory is divided into nine different sub-dimensions and contains ninety items in total: Depression, somatization, phobia, anxiety, psychoticism traits, interpersonal sensitivity, hostility, paranoid ideation and obsessive-compulsive symptoms. Each dimension includes between six and thirteen questions. Participants were asked to answer the questions by thinking about their experiences over the past fifteen days. Responses were categorized as "not at all, very little, moderately, quite a lot, and extremely".

**Table 1.** Distribution of participants according to sociodemographic characteristics

	N	%
<b>Age</b>		
26-30	84	29,8
31-35	120	47,6
36 and above	78	27,7
<b>Marital Status</b>		
Married	268	95
Divorced	9	3,2
Lives separately	5	1,8
<b>Number of Children</b>		
1	89	31,6
2	152	53,9
3	40	14,2
4 and above	1	0,4
<b>Child's Age</b>		
4	81	28,7
5	201	71,3
<b>Working Status</b>		
Working	139	49,2
Does not work	143	50,8
<b>Educational Status</b>		
Primary education	38	13,5
High school	114	40,4
Licence	103	36,5
Degree	27	9,6
<b>The time children spend with daily technological devices</b>		
Less than 1	125	44,3
1-3	140	49,6
3-5	16	5,7
6 and above	1	0,4

*Young Internet Addiction Test Short Form (YIAT-SF)*: This scale was developed by Young to measure the presence and severity of pathological internet use. The YIAT-SF, which was converted into a short form by Pawlikowski et al. consists of 12 items and is a five-point Likert-type scale (1=Never, 5=Very often) (16, 17). There are no reverse coded items in the scale. Therefore, high scores obtained from the scale indicate a high level of pathological use. The minimum score that can be obtained from the scale is 12 and the maximum score is 60.

*Family-Child Internet Addiction Scale (FCIAS)*: The Parent-Child Internet Addiction Scale is a six-level Likert-type scale and is completed by parents. The aim of the scale is to determine children's perceived level of pathological internet use. The scale levels consist of "Not Applicable", "Rarely", "Occasionally", "Mostly", "Very Often" and "Consistently" options. These options are given scores between 0-5 respectively. As a result of this scale, a score of 80 and above indicates that the child's internet use is at a pathological level, a score of 50-79 points indicates limited symptoms, and a

score of 49 points and below indicates that there are no symptoms (18). The scale can be applied to parents with children up to the age of 17.

*Sociodemographic Data Form*: The sociodemographic data form, which was created to collect personal information, includes 7 questions in total. It includes questions about the participants' gender, age, marital status, employment status, number of children, education level and the time children spend with technological devices daily.

## Process

At the beginning of the cross-sectional study, ethical approval for the study was obtained from the ethics committee of Gelişim University at its meeting dated 18.11.2019 and numbered 2019-20. After obtaining the necessary permissions from two kindergartens in Istanbul (Abdülkadir Öztürk Kindergarten and Avcılar Selahattin Müzeyyen Kaçaker Kindergarten), mothers were contacted and asked to fill out the scales face-to-face. The scales were delivered to the mothers by students, and announcements were made through communication channels involving teachers and parents. After the mothers agreed to participate in the study in the consent form prepared according to the Declaration of Helsinki, they completed the Sociodemographic Information Form, SCL-90-R Symptom Screening Test, Young Internet Addiction Test Short Form and Family-Child Internet Addiction Scale respectively. The participants were informed that they should be in a distraction-free environment so that they could focus while completing the scale questions. Afterwards, the data of the participants were collected according to the schedule determined with the school administration. Data were collected between November 2019 and February 2020.

## Data Analysis

SPSS Statistics 26 and SPSS Process v4.2 package programs were used to analyze the research data. In all statistical evaluations, .05 was accepted as a significant value. Descriptive and intergroup analyses were performed after testing the normal distribution of sociodemographic data using kurtosis



**Table 2.** Results of correlation analysis between variables (N = 282)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Mother-PIU	1,000												
2. Mother-PPS Total	0,477**	1,000											
3. Mother PPS-Somatic	0,284**	0,777**	1,000										
4. Mother PPS-OCD	0,396**	0,756**	0,513**	1,000									
5. Mother PPS IS	0,360**	0,800**	0,494**	0,587**	1,000								
6. Mother PPS-Depression	0,437**	0,873**	0,614**	0,636**	0,672**	1,000							
7. Mother PPS-Anxiety	0,445**	0,800**	0,622**	0,480**	0,572**	0,618**	1,000						
8. Mother PPS-Hostility	0,237**	0,684**	0,467**	0,420**	0,522**	0,566**	0,555**	1,000					
9. Mother PPS-Phobia	0,355**	0,669**	0,496**	0,431**	0,525**	0,524**	0,570**	0,393**	1,000				
10. Mother PPS IS	0,348**	0,770**	0,469**	0,550**	0,702**	0,673**	0,545**	0,527**	0,471**	1,000			
11. Mother PPS Psychoticism	0,403**	0,795**	0,567**	0,536**	0,634**	0,644**	0,647**	0,536**	0,502**	0,588**	1,000		
12. Mother PPS Extra points	0,406**	0,762**	0,528**	0,615**	0,557**	0,630**	0,554**	0,448**	0,463**	0,568**	0,559**	1,000	
13. Child - PIU	0,350*	0,280**	0,172**	0,272**	0,260**	0,253**	0,204**	0,149*	0,126*	0,258**	0,253**	0,169**	1,000

\*\* $p < .001$ , \* $p < .05$ . Abbreviations = PIU: Pathological Internet Use; PPS: Psychopathological Symptoms; OCD: Obsessive Compulsive Disorder; IS: Interpersonal Sensitivity; PT: Paranoid Thoughts

and skewness values and Levene's test in the SPSS program. In determining the control variable, the variables that showed a significant correlation above .20 as a result of the Pearson correlation test within the dependent variable and sociodemographic information were taken as the basis. Then, in order to test the mediating variable, Model 4 was used in the SPSS Process program. In testing the models of the mediation effect, the significance analysis of the models and relationships was carried out with the Bootstrap Confidence Interval or Monte Carlo Confidence Interval tests. The criterion of not including the value 0 in the lower and upper confidence interval values with 95% confidence intervals was taken into consideration; if it contains a value of 0, the mediation effect cannot be mentioned ( $p > .05$ ). The data were analyzed by determining 5000 resampling options with the Bootstrap technique.

## RESULTS

### *Correlation Analysis of Mother and Child's Pathological Internet Use and Mother's Psychopathological Symptoms*

The aim of this study is to examine the effect of psychopathological symptoms of the mother on the relationship between mother and child's pathologi-

cal internet use. In parallel with the research purpose, the significant relationship between the dependent, independent and mediating variables was examined in the first stage (see Table 2). According to the table, there were significant and positive relationships between mothers' PIU levels and psychopathological symptoms ( $r = .477$ ,  $p < .001$ ), between mothers' PIU levels and children's PIU levels ( $r = .350$ ,  $p < .001$ ), and between mothers' psychopathological symptoms and children's PIU levels ( $r = .280$ ,  $p < .001$ ).

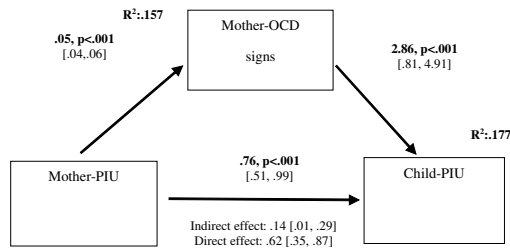
According to the results of Pearson correlation analysis conducted to determine the control variable before the mediation effect test, a significant and positive relationship was found between the child's age and the child's pathological internet use ( $r = .129$ ,  $p < .05$ ) and between the time the child spent with technology and the child's pathological internet use ( $r = .211$ ,  $p < .01$ ) among the sociodemographic variables. However, since the correlation strength of the child's age was below .20, it was not included in the study as a control variable. No significant relationship was found with other sociodemographic variables ( $p > .05$ , see Table 3).

**Table 3.** Results of correlation analysis between child PIU and sociodemographic variables

	Mother's Age	Mother Marital Status	Number of Children	Child's Age	Mother-Employment Status	Mother-Educational Status	Child Time Spent on Technology
Child PIU	.042	-.053	.029	.129*	-.008	.088	.211**

\*  $p < .05$ , \*\*  $p < .01$ . Abbreviations = PIU: Pathological Internet Use

**Figure 1.** Mediating effect of mother's OCD symptoms in the relationship between mother - PIU and child - PIU

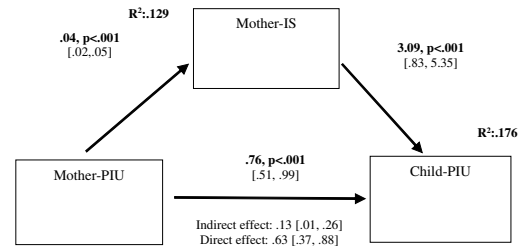


### Mediation Test Analysis of Maternal Psychopathological Symptoms

In the first stage of the mediation effect test, the mediating effect of the OCD symptoms of the mother on the relationship between the mother's pathological internet use level and the child's pathological internet use level was evaluated, controlling for the time spent by the child with technological devices. Firstly, it was observed that the mother's pathological internet use significantly and positively affected OCD symptoms (b = .05, t(279) = 7.22, p < .001). Mother's pathological internet use significantly and positively affects child's pathological internet use (b = .61, t(278) = 4.64, p < .001). Mother's OCD symptoms have a significant and positive effect on child's pathological internet use (b = 2.86, t(278) = 2.75, p < .001). According to the mediation effect test, mother's OCD symptoms significantly partially mediated the relationship between mother's pathological internet use and child's pathological internet use (b = .14, 95% CI [.01, .29], see Figure 1).

The mediating effect of the mother's level of sensitivity in interpersonal relationships on the relationship between the mother's level of pathological internet use and the child's level of pathological internet use was evaluated. Firstly, it was observed

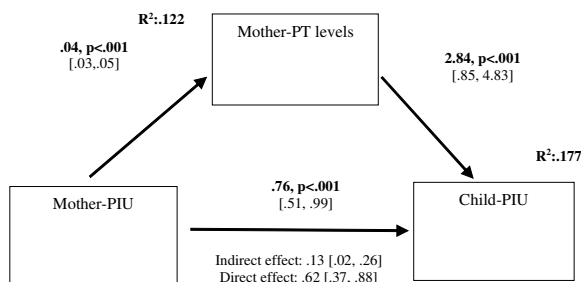
**Figure 2.** Mother's interpersonal sensitivity (IS) in the relationship between mother - PIU and child - PIU



that the mother's pathological internet use significantly and positively affected the level of sensitivity in interpersonal relationships (b = .04, t(279) = 6.45, p < .001). Mother's pathological internet use significantly and positively affects child's pathological internet use (b = .63, t(278) = 4.85, p < .001). Mother's level of sensitivity in interpersonal relationships has a significant and positive effect on child's pathological internet use (b = 3.09, t(278) = 2.7, p < .01). According to the mediation effect test, mother's level of interpersonal sensitivity significantly partially mediated the relationship between mother's pathological internet use and child's pathological internet use (b = .12, 95% CI [.01, .26], see Figure 2).

The mediating effect of the mother's paranoid ideation symptom level on the relationship between the mother's pathological internet use level and the child's pathological internet use level was evaluated. Firstly, it was observed that the mother's pathological internet use significantly and positively affected the level of paranoid ideation (b = .04, t(279) = 6.22, p < .001). Mother's pathological internet use significantly and positively affects child's pathological internet use (b = .63, t(278) = 4.87, p < .001). Mother's paranoid ideation symptom level has a significant and positive effect on child's pathological internet use (b = 2.84, t(278) = 2.82, p < .01). According to the mediation effect test, mother's paranoid ideation symptom level significantly partially mediated the relationship between mother's pathological internet use and child's pathological internet use (b = .13, 95% CI [.02, .26], see Figure 3). The mediation tests examining the other variables of the symptom screening test (somatization, depression, anxiety, phobia, psychoticism, and hostility) were not significant (p > .05).

**Figure 3.** Mediating effect of mother's paranoid thought (PT) symptoms in the relationship between mother - PIU and child - PIU



## DISCUSSION

As a result of the analyses conducted within the scope of this study, it was seen that OCD, interpersonal sensitivity and paranoid thoughts in mothers had a partial mediating effect on the relationship between mothers' pathological internet use and their children's pathological internet use. It is seen that as the levels of these symptoms in mothers increase, the levels of pathological use also increase. On the other hand, somatization, depression, anxiety, anger and hostility, phobic anxiety and psychotic symptoms did not have any mediating effect on the relationship between the pathological internet use of mothers and their children.

The fact that psychopathological symptoms are observed in mothers indicates that psychopathological symptoms may also be observed in preschool children (19). In line with the results of this study, it is hypothesized that the presence of these psychopathological symptoms in mothers may interrupt the caregiving process of their children and thus they may not receive adequate support. The child, on the other hand, may start spending more time on the internet in order to fill the gap arising from this deficiency. Problematic internet use can be considered as a dysfunctional strategy in the face of upsetting experiences and stressful life events (20). In a study conducted by Lam L.T., it was concluded that maternal depression was associated with internet addiction in adolescents (8). In a different study, it was concluded that there was a relationship between the duration of excessive looking at the television screen of children aged 2-5 years and depression seen in their mothers (21). In the present study, depressive symptoms were not found to have any mediating role in the relationship between mother and child's pathological internet use; however, when the items measuring interpersonal sensitivity in the SCL-90 are examined, it is seen that these are items that express the difficulties experienced due to thoughts of inadequacy and thoughts of self-deprecation. Considering that the difficulties that individuals may experience in these areas may also be symptoms that prepare the ground for a depressive mood (22), it is thought

that the current study cannot be considered separately from these studies.

In a study conducted in Turkey, it was observed that there was an increase in psychosocial problems with the increase in internet use by family members. It was found that children and adolescents experienced more problems than adults (23). Socialization is an important part of early academic skill development and is usually supported by the involvement of each member of the environment (e.g. family members, siblings or peers). There is evidence that there is a significant relationship between excessive use of technological devices and low self-esteem, anxiety, depression, social isolation, shyness, emotional and social skill deficiencies. According to Mustafaoğlu and Yasacı's study, technology has been reported to cause mental problems, anxiety and aggressive attitudes (24). Frequent use of electronic devices by children and parents reduces the productive time they can spend together and eliminates the activities they can do together (25). Another study revealed that preschool children were unhappy with their parents' use of the Internet at home. It was found that while parents spent time on the internet, most of the children spent time on smartphones, tablets and applications on computers (26). In an environment where preschool children need parental control, parents should first improve their own internet use habits and have healthy technology knowledge.

In a study conducted by Ko et al. with 517 adolescents in Taiwan, it was concluded that the level of pathological internet use was higher in adolescents with poor maternal care (27). According to the results of another study conducted in the Netherlands, the quality of communication between parent and child may be damaged by psychopathological symptoms developed by the parent (11). In a study conducted in Turkey, it was found that when the time adolescents spent with their mothers increased, social support increased and the level of internet addiction decreased (28). These three studies reveal similar results: Internet addiction can be mentioned in cases where family functioning is low. Family members may develop a predisposition to pathologically use technology to avoid difficulties that may arise. All research and current study results show that in a relationship

where one of the family members shows pathological signs or symptoms, the likelihood of addiction in children increases. The way caregivers communicate with their children and their upbringing style affect the satisfaction that children get from technology. From a different perspective, the family-child internet addiction relationship can be explained through social learning theory (29): Children may take caregivers' time spent on the internet as a model and develop addictive behaviors. The assumption here is that children will normalize the behavior of their family members and think that they can do it themselves.

The findings of the study showed that the mother's interpersonal sensitivity symptom had an effect on the mother-child internet use relationship. Studies in the literature (30, 31, 32, 33) show that interpersonal sensitivity symptom is associated with the tendency not to be involved in real social environments. People with high scores on this symptom tend to actively use virtual environments or social media to solve their problems (30) and it has been found that addiction to any social media channel may be associated with high levels of interpersonal sensitivity (22). The results of the current research are in parallel with the literature; it is also assumed that the mother's behaviors related to interpersonal sensitivity symptoms have an effect on the mother and child's tendency to use the internet. Instead of using technology products to solve problems or communicate in real life, the mother may actively use technology products as a role model for the child. This may explain the child's reliance on technology among his/her habits. Similarly, in the study, it was observed that OCD and paranoid ideation symptoms mediated the mother-child internet use. The common view for both variables is that psychopathological symptoms are associated with internet use and are a sustaining factor in pathological internet use (33, 34). In addition to the results of this study, it was observed that the mother's psychopathological symptoms affected the child's pathological internet use and it is thought that this study contributes to the literature since there are few studies examining this relationship.

Since children's pathological internet use was not directly measured, it was evaluated as perceived by the mothers. Therefore, the study was limited. The limited number of institutions selected for samp-

ling within the scope of the study constituted a limitation in terms of representing the population. The findings were limited to the scale items used for the research. Future studies can be conducted with larger sample groups. In addition, psychopathological symptoms of children were not questioned in the current study. Since the presence of psychopathological symptoms may affect pathological internet use, the study was limited in this respect. Finally, the categorical measurement of the age variable of the mothers caused the limitation of the analysis.

Other studies to be conducted within the scope of a similar topic can be created in the context of different demographic data. Thus, demographic information can be compared. It is also thought that the same research design should be applied for fathers; it is predicted that fathers' pathological symptoms and their predisposition to technology may be different from mothers. Finally, the research design can be re-planned according to the variability of internet use (e.g. gaming, shopping or social media).

As a result, there is a direct positive relationship between mothers' internet use and perceived internet use in preschool children. Children's screen time increases when mothers have psychopathological characteristics. For this reason, the primary measures to protect young children from pathological internet use can be achieved by improving maternal mental health and preventing excessive internet use by mothers. Thanks to technological developments, content that can positively affect children's development can be mentioned; however, both children and family members should be sensitive to the time and manner of using technology. The fact that parents play a guiding role in guiding their children's use of the internet will ensure that the process progresses in a healthier way.

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# Investigation of the relationship between intentional self-injurious behaviors and parenting styles of OCD diagnosed adolescents

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## SUMMARY

**Objective:** The current study aimed to examine the relationship between intentional self-injurious behaviors and parenting styles in adolescents diagnosed with OCD.

**Method:** The study comprised fifty patients who were diagnosed with obsessive-compulsive disorder between the ages of 12 and 18. Sociodemographic data form, Inventory of Statements About Self-injury (ISAS) and Parenting Style Scale (PSS) were the data collection tools used in the study.

**Results:** It was found that there is a moderate and negative correlation between the intentional self-injurious behaviors and acceptance/involvement ( $r = -.44$ ,  $p < 0.01$ ) and psychological autonomy parenting styles ( $r = -.38$ ,  $p < 0.01$ ). Also there is a moderate and positive correlation between the intentional self-injurious behaviors and the strictness/supervision parenting style ( $r = .48$ ,  $p < 0.01$ ). It was determined that there is a moderate and negative relationship between autonomous functions of self-injurious behaviors and acceptance/involvement ( $r = -.51$ ,  $p < 0.01$ ) and psychological autonomy parenting styles ( $r = -.45$ ,  $p < 0.01$ ). Also and a moderate and positive relationship between the autonomous functions of self-injurious behaviors and strictness/supervision parenting style ( $r = .42$ ,  $p < 0.01$ ). Results showed that there is a moderate and negative relationship between social functions of self-injurious behaviors and acceptance/involvement ( $r = -.35$ ,  $p < 0.01$ ), and a moderate and positive relationship between strictness/supervision parenting styles ( $r = .50$ ,  $p < 0.01$ ). It was found that strictness/supervision parenting style predicted intentional self-injurious behaviors ( $R = .48$ ,  $R^2 = .23$ ,  $p < 0.05$ ).

**Discussion:** As the strictness/supervision perceived from parents increases and the encouragement and acceptance/involvement for psychological autonomy decreases, intentional self-injurious behaviors increase in adolescents diagnosed with obsessive-compulsive disorder.

**Key Words:** Adolescent, obsessive-compulsive disorder, self-injurious behaviors, parenting styles

## INTRODUCTION

Obsessive-compulsive disorder (OCD) is a psychiatric disorder that affects nearly 4% of adolescents, characterized by recurrent obsessions (repetitive thoughts, visuals, and impulses) and compulsions (repeated behaviors or mental actions that are felt to reduce anxiety) (1,2).

Obsessions come to mind without the will and show a repetitive pattern. These thoughts create anxiety, and people may develop compulsions to cope with these thoughts. Compulsions are ritualistic and car-

ried out within the framework of specific rules. However, compulsions can only provide momentary relief; Obsessions and the anxiety they create continue to exist in the person (3). Intentional self-injurious behaviors (ISIB) is one of the compulsive behaviors that people with OCD can develop to cope with the anxiety created by obsessions, and its incidence in individuals with OCD is 7.43% (4,5). At the same time, in DSM-5, disorders characterized by ISIB such as trichotillomania (hair picking disorder) and skin picking disorder are among the disorders related to OCD and can often be seen together (6,7).

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ISIB is the damage made by an individual deliberately to his body tissues without the intention of suicide. Cutting, biting, burning, and pinching are the most prevalent types (8). Its global prevalence among adolescents is approximately 20% (9). ISIB in adolescents can have many purposes, such as trying to cope with negative emotions, getting away from recurring disturbing thoughts, and solving problems in interpersonal relationships (8). Parenting styles are crucial in the emergence and maintenance of ISIB, according to research done on adolescents (10,11,12).

It is stated that adolescents diagnosed with OCD show similar symptoms as adults, but unlike adults, an OCD condition characterized only by compulsions can be encountered more frequently in adolescents (13). It is thought that compulsions that do not develop due to obsession may cause more confusion both in the adolescent and his/her environment. Although people diagnosed with OCD often find their obsessions and compulsions irrational, they attach excessive importance to their thought content (14,5). They may feel an exaggerated responsibility for their thought content and often tend to blame themselves for their symptoms (15,3). Due to the nature of the disease, adolescents may encounter many difficulties in daily life and may have difficulty being understood by their environment and parents. Some parents fail to realize that their OCD symptoms develop involuntarily and may display an accusatory, punitive, and hostile attitude (16,13).

In adolescence, a period of intense need for psychological autonomy, negative family attitudes such as controlling behavior may lead to more conflict with parents (17,18). In addition, it is known that these negative attitudes and conflictual family environment may be associated with the development and severity of OCD symptoms in parallel with increased anxiety (19,13). Also, negative parenting styles such as punitive and overprotective have been linked to ISIB in adolescents (20,11). Therefore, it is thought that conflicts with parents and adverse reactions may make it difficult for adolescents to cope with current symptoms and increase the tendency to ISIB, which is one of the maladaptive coping behaviors. It is thought that adolescents diagnosed with OCD may internalize the need of control that their parents try to estab-

lish over them. Therefore, the need for autonomy that is not met by their parents is tried to be met by establishing dominance over their bodies.

It is stated that it is significant to include parents in research on adolescents (18). It has been observed that the inclusion of family-based approaches in the psychotherapeutic interventions of adolescents diagnosed with OCD can reduce the severity of symptoms, and similarly, various family therapies provide benefits in adolescents who engage in ISIB (13, 21-23). The purpose of this research is to examine the relationship between ISIB and parenting styles in adolescents diagnosed with OCD. The hypotheses of the study are as follows: 1) There is a significant and positive relationship between ISIB and strictness/supervision parenting style. 2) As acceptance/involvement and psychological autonomy parenting styles increase, ISIB decreases. 3) There is a negative relationship between autonomous functions of ISIB and acceptance/involvement and psychological autonomy parenting styles.

## METHOD

### Study Type

This study was performed by using the relational screening method. The relational screening model provides information about the level and direction of the relationship between two or more variables. The existence of change when variables interact with each other is questioned, and if there is any change, this change is explained based on a relationship or predictor effect, no cause-and-effect information is obtained (24).

### Sampling

The population of the study consisted of adolescents living in Istanbul and diagnosed with OCD. The participants of the study consisted of 50 patients between the ages of 12-18, who voluntarily participated in the study between November-December 2023, who were diagnosed with OCD by a psychiatrist according to DSM-5 criteria and received outpatient psychiatric treatment.

Having a diagnosis of conduct disorder, post-traumatic stress disorder, and alcohol substance abuse were accepted as exclusion criteria while having a diagnosis of OCD, being an adolescent, and engaging in deliberate self-injurious behaviors were accepted as inclusion criteria.

### Assessments

Inventory of Statements About Self-injury and Parenting Style Scale were completed by the adolescents diagnosed with OCD and the sociodemographic data form was filled out by the parents.

### Sociodemographic Data Form

The researchers developed the sociodemographic data form with the study's goals in view. Only one of the items in the form is directly related to the characteristics of the participants, and this item is aimed at questioning the gender of the participants.

*Inventory of Statements About Self-injury (ISAS):* ISAS developed by Klonsky and Glen (25) was adapted into Turkish by Bildik et al. (26). The inventory consists of two parts. In the first part, 12 types of ISIB, such as cutting, hair pulling, and pinching, which are not suicidal, are questioned. In the second part of the scale, there are a total of 39 questions evaluating autonomous functions and social functions sub-dimensions. Autonomous functions includes affect regulation, anti-suicide, marking distress, self-punishment and anti-dissociation subscales. Social functions includes the subscales of interpersonal boundaries, interpersonal influence, revenge, sensation seeking, peer bonding, toughness, autonomy and self-care. There are three questions corresponding to each function and the questions are evaluated as “not relevant -0”, “partially relevant-1”, “very relevant -2”. Cronbach’s Alpha was found to be 0.71 for the first part of the scale, .88 for autonomous functions, and .80 for social functions by Bildik et al. (26). In this study, the Cronbach Alpha value was .94 for the total score, .89 for autonomous functions, and .90 for social functions.

*Parenting Style Scale (PSS):* Yilmaz (27) adapted into Turkish the Parenting Style Scale created by

Lamborn et al. (28). The scale, which aims to evaluate parenting styles, consists of three subscales: acceptance/involvement, psychological autonomy, and strictness/supervision. The acceptance/involvement subscale assesses the extent to which children perceive their parents as loving and caring, the strictness/supervision subscale assesses the extent to which children perceive their parents as controlling, and the psychological autonomy subscale assesses the extent to which children perceive their parents as democratic and help them to be individual. The subscales include 9, 8, and 9 items respectively. Yilmaz (27) reported Cronbach’s Alpha as 0.72 for the acceptance/involvement subscale, .76 for strictness/supervision, and .82 for psychological autonomy. In this study, the Cronbach Alpha value was .66 for acceptance/involvement, .70 for psychological autonomy, and .86 for strictness/supervision.

### Procedure

Necessary permissions and scale information were obtained from the people who conducted the Turkish adaptation of the scales to be utilized in the research. Then, the research was started with the approval of the ethics committee numbered 2023/11 dated 13/11/2023 from the Istanbul Aydin University Ethics Commission. The scales, instructions, and information form were given in person to the study participants who gave their consent as well as their parents. The participants did not provide any personal information. The scales took twenty minutes on average to complete.

### Statistical analysis

The data was analyzed using the "Statistical Package for the Social Sciences" (SPSS) 25 application. Checking the normal distribution assumption was one of the analysis's initial phases. Kurtosis and skewness values of the scale and its subscales were examined during this phase. To evaluate this assumption, kurtosis and skewness coefficients were examined, and, with reference to the study of Hahs-Vaughn & Lomax (30), it was determined that these values provided normal distribution as they were in the -2 +2 reference range.

Pearson Correlation Analysis was used to examine

**Table 1.** Distribution of intentional self-injurious behavior types of the participants

	N	%
Cutting	9	18.0
Biting oneself	10	20.0
Burning	4	8.0
Severe scratching	5	10.0
Pinching	15	30.0
Pulling hair	32	64.0
Carving	15	30.0
Banging or hitting self	28	56.0
Interfering with wound healing	35	70.0
Rubbing skin against rough surface	5	10.0
Sticking self with needles	6	12.0
Swallowing dangerous substances	2	4.0

the relationship between the Inventory of Statements About Self-injury and the Parenting Style Scale; Multiple Linear Regression Analysis was used to examine the predictive power of Parenting Style on Self-injury Behaviour. The p-value to be taken as a reference is 0.05 and the confidence interval value is 95%.

## RESULTS

60% of the participants are women (n=30), 40% are men (n=20), and 100% are cared for by their mothers.

As a result, the most common injury behaviors are interfering with wound healing (70% n=35), pulling hair (64% n=32), banging or hitting self (56% n=28), pinching (30% n=15), and carving (30% n=15). (Table 1)

There is a moderate and negative correlation between the ISAS and acceptance/involvement ( $r=-.44$ ,  $p<0.01$ ), a moderate and negative correlation between the ISAS and psychological autonomy ( $r=-.38$ ,  $p<0.01$ ), and a moderate and positive correlation between the ISAS and strictness/supervision ( $r=.48$ ,  $p<0.01$ ) (Table 2).

There is a moderate and negative relationship between autonomous functions and acceptance/involvement ( $r=-.51$ ,  $p<0.01$ ), a moderate and negative relationship between autonomous functions and psychological autonomy ( $r=-.45$ ,  $p<0.01$ ), and a moderate and positive relationship between autonomous functions and strictness/supervision ( $r=.42$ ,  $p<0.01$ ) (Table 2).

There is a moderate and negative relationship

between social functions and acceptance/involvement ( $r=-.35$ ,  $p<0.01$ ), a weak and negative relationship between social functions and psychological autonomy ( $r=-.29$ ,  $p<0.05$ ), and a moderate and positive relationship between social functions and strictness/supervision ( $r=.50$ ,  $p<0.01$ ) (Table 2).

The regression model was obtained using the stepwise method. With the stepwise method, variables that do not have significant predictors are removed from the model. For this reason, acceptance/involvement and psychological autonomy dimensions were removed from the model and the analysis continued. It was determined that the strictness/supervision independent variable predicted intentional self-injurious behaviors dependent variable score ( $R=.48$ ,  $R^2=.23$ ,  $p<0.05$ ). It was determined that the independent variable in the regression model explained 23% of the change in intentional self-injurious behaviors. When the results are evaluated, strictness/supervision has a positive effect on intentional self-injurious behaviors ( $\beta=.48$ ,  $p<0.05$ ) (Table 3).

## DISCUSSION

The current study aimed to examine the relationship between ISIB and parenting styles in adolescents diagnosed with OCD. The findings of the study confirm the first and second hypotheses. It was found that there was a significant and negative relationship between ISIB and acceptance/involvement and psychological autonomy parenting styles and a significant and positive relationship between ISIB and strictness/supervision parenting style. Upon reviewing the studies it is revealed that increasing controlling, rejecting, and punitive styles in parents and decreasing acceptance and understanding are significantly related to OCD symptoms in adolescents (31,32). It is observed that 40% of adolescents diagnosed with OCD perceive their parents as authoritarian (33). Negative parenting styles such as control/monitoring, which are connected to with the formation and maintenance of

**Table 2.** Relation between intentional self-injurious behaviours and parenting styles

	1	2	3	4	5	6
1-ISAS	1					
2-Autonomous functions	.94**	1				
3-Social functions	.96**	.80**	1			
4-Acceptance/involvement	-.44**	-.51**	-.35*	1		
5- Psychological autonomy	-.38**	-.45**	-.29*	.43**	1	
6- Strictness/supervision	.48**	.42**	.50**	-.61**	-.62**	1

\*\* $p<0.01$  \* $p<0.05$  Test used: Pearson Correlation Test  
ISAS: Inventory of Statements About Self-injury

**Table 3.** Findings related to the prediction of strictness/supervision on intentional self-injurious behaviors

	B	SH	B	T	p
(Constant)	-4.35	5.87		-0.74	0.462
Strictness/supervision	0.88	0.23	0.48	3.83	0.000
<i>R</i> =.48 <i>R</i> <sup>2</sup> =.23					
<i>F</i> =14.70 <i>p</i> =0.000*					

\**p*<0.05 Test used: Multiple Linear Regression Analysis; Stepwise Method

OCD symptoms, may trigger unfavorable emotions like loneliness and anxiety in adolescents with OCD and lead to beliefs of guilt. In adolescents, harsh punishments and controlling attitudes can lead to high levels of anxiety, severe OCD symptoms, and ISIB (20,34,35). Overprotection and overcontrol attitudes in parents are among the types of childhood trauma (36). McLafferty et al. (37) found that adverse experiences in childhood and excessive parental control affect coping with stress throughout life. They revealed that these two phenomena are associated with ISIB in stressful situations. It is thought that overly controlling and overprotective parenting styles, which can also lead to OCD symptoms, may prevent the development of functional coping skills in adolescents diagnosed with OCD. When the current study findings are examined, it is seen that consistent with previous studies, strictness/supervision parenting style predict ISIB. It is assumed that adolescents diagnosed with OCD may use ISIB in a dysfunctional way in order to cope with the distress and tension caused by the existing symptoms, as well as the anxiety that may be caused by the opposing styles of the parents.

The results demonstrate that interfering with wound healing is the most common ISIB method. Studies conducted with adolescents support this finding (38,39). Many ISIB can result in wounds on the body and leave scars. It is stated that when adolescents injure their bodies, they may desire to express their distressing feelings through their bodies, and these behaviors may be seen as a cry for help (40). It is thought that the wounds on the bodies of adolescents diagnosed with OCD represent the negative emotions they experience. It is also assumed that the intense desire to control in OCD (3) may also manifest in the body. Therefore, for these people, the healing of the wound may mean that their distress is prevented from being seen and that they have lost control over their bodies.

Excessive responsibility imposed by parents can lead to both the onset and persistence of OCD symptoms and negatively affect the treatment pro-

cess of adolescents (41,13). In the current study, it is seen that there is a significant and positive relationship between autonomous functions, one of the sub-dimensions of ISIB and strictness/supervision one of the sub-dimensions of parenting styles. The finding in question shows that as the strict behaviour and supervision of parents increases, ISIB to motivations involving autonomous functions such as emotion regulation, suicide prevention, and self-punishment increase in individuals with OCD. Parents' styles towards strictness/supervision trying to maintain can also be internalized in the adolescent, resulting in a control over their own thoughts and behaviors and taking on excessive responsibility (47,17). It is stated that this situation can both serve the formation of OCD symptoms and lead to anxiety and excessive guilt due to the responsibility for the current symptoms (42,13,23). Parents' use of strategies such as giving conditional love and creating a feeling of guilt in order to maintain control over their children can lead to internalization problems such as anxiety, depressive symptoms, and guilt beliefs in adolescents (43). It is thought that adolescents diagnosed with OCD may feel inappropriately responsible and therefore guilty for their obsessional attitudes, and may want to punish themselves just as their families punish them, and may engage in ISIB for this purpose.

It is observed that parents of adolescents who ISIB often exhibit a rejecting and controlling attitude (44). It is known that such non-accepting and authoritarian attitudes of parents may result in increased negative emotions, difficulty in emotion regulation, and ISIB in adolescents (45,46,47,48). Therefore, it is assumed that adolescents with OCD who have parents with controlling attitudes may lack the ability to use more functional ways to regulate their negative emotions. Also with their current symptoms their negative emotions become more elevated therefore the need for sudden relief by self injury increases. In support of this assumption and the third hypothesis of the study, the findings of the current study show that there is a negative and significant relationship between autonomous functions and acceptance/involvement

and psychological autonomy; there is a significant and positive relationship between autonomous functions and strictness/supervision. These findings suggest that as parents' acceptance and interest in adolescents diagnosed with OCD and their incentives for individualization increase, adolescents' ISIB aimed at punishing themselves, preventing suicide, regulating their emotions, and labeling their distress are decreasing. However, as parents' supervision and control behaviors increase, ISIB related to these motivations increase. Furthermore, it is assumed that parents' controlling attitudes, their critical attitudes towards their children's feelings and thoughts, and their lack of acceptance towards their children will also continue against the existing OCD symptoms. Therefore, adolescents with OCD may believe that both their symptoms and themselves are not understood, and this may lead to anxiety and depressive symptoms. It is thought that they will have difficulty in naming, expressing and regulating the intense negative emotions experienced and may engage in ISIB to cope with this situation. Supporting this assumption, Zhu et al. (47) show that depressive symptoms play a mediating role in the relationship between parental rejection and ISIB in adolescents.

Parents display an overly normative attitude towards their adolescent children, constantly try to keep them under control, do not allow them to develop a sense of autonomy, and expect their children to meet unrealistic expectations. It can lead to the formation of dysfunctional thoughts in the minds of children that the world is a harmful and dangerous place (49). Therefore, they may feel threatened and inadequate in the face of the outside world. It is thought that this situation may affect adolescents' ability to cope with stress; they may feel inadequate to cope with the negative emotions they experience, and they will develop dysfunctional ways. As a matter of fact, it is known that a control-oriented parenting styles negatively affects emotion regulation skills in adolescents, while a parenting styles containing warmth and acceptance positively affects emotion regulation skills (50). It is assumed that in adolescents with a diagnosis of OCD, damaging their bodies may create a body perception that is only under their own control, and that they try to set a boundary between themselves and their parents with this dysfunctional coping strategy. In support of this assumption, the findings obtained from the current study show

that there is a negative and significant relationship between social functions of ISIB and acceptance/involvement and psychological autonomy parenting style; there is a significant and positive relationship between social functions of ISIB and strictness/supervision parenting style. These findings show that as parents' encouragement towards the individuation of adolescents diagnosed with OCD and their acceptance and interest towards them increases, the adolescent's ISIB decreases in order to provide interpersonal boundaries, revenge, endurance, and autonomy. When parents' strict and supervisory styles increase, ISIB due to these motivations increases.

The absence of a control group to compare the types and levels of parenting styles and ISIB levels study is an important limitation of the study. It is recommended that future studies should include people who have OCD diagnosis but do not show ISIB in order to generalize the findings.

The scale used in the current study only measures adolescents' perceptions of parenting styles. In future studies, it is recommended to use a self-report scale in which parents also evaluate their styles and clinical assesment of the psychiatrist about parents' styles to be able to compare the consistency of parenting styles perceived by adolescents, parents and clinicians.

In this study, the relationship between ISIB and parenting styles in adolescents diagnosed with OCD was examined. It was revealed that there was a positive relationship between ISIB in adolescents diagnosed with OCD and strictness/supervision parenting style. It was determined that there was a negative relationship between ISIB in adolescents diagnosed with OCD and acceptance/involvement and psychological autonomy parenting styles. It was found that as parents' acceptance and interest in adolescents diagnosed with OCD and their incentives for individualization increase, adolescents' ISIB aimed at punishing themselves, preventing suicide, regulating their emotions, labeling their distress, providing interpersonal boundaries, revenging, endurance, and autonomy are decreasing. However, it has been revealed that as parents' supervision and control behaviors increase, ISIB related to these motivations increases. It is thought that it would be beneficial to include studies

focused on family-based psychological interventions in OCD psychotherapy in adolescents. Furthermore it is thought that providing psychoeducation to parents regarding OCD symptoms, ISIB, and negative parenting styles may contribute to the process.

*Conflict of Interest:* There is no conflict of interest,

according to the authors.

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# Body dysmorphic disorder and depression symptoms in patients seeking rhinoplasty: The mediating role of self-esteem and anxiety

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## SUMMARY

**Objective:** Body dysmorphic disorder (BDD) is prevalent in patients seeking for rhinoplasty. Yet, psychological assessment of rhinoplasty patients is often dismissed in clinical practice. Findings on depression and anxiety, the two conditions that are highly comorbid with BDD, as well as possible associations between depression and self-esteem are however mixed in the very same group. This study aimed to test a model that explains the relationship between BDD and depression symptoms mediated by self-esteem and symptoms of anxiety.

**Method:** 50 rhinoplasty-planned patients and 42 healthy participants were recruited (Age range: 18-54 years, M=28). Demographic information, scores of BDD, depression and anxiety symptoms and self-esteem were collected.

**Results:** Study groups did not differ significantly in terms of age, gender, level of education/income, marital/work status and history of psychiatric treatment. BDD symptom scores, on the other hand, were significantly higher in the rhinoplasty group compared to control group ( $p<.001$ ). Symptom scores of BDD, depression and anxiety were correlated significantly in both study groups ( $p<.001-.05$ ). The mediation model tested showed that self-esteem and anxiety symptoms significantly mediated the relationship between BDD and the depressive symptoms.

**Discussion:** The model holds promise not only for explaining the mixed results of anxiety and depression in rhinoplasty patients but also for drawing inferences about the role of self-esteem and anxiety on the relationship between BDD and depression

**Key Words:** Rhinoplasti, body dysmorphic disorder, depression, self-esteem, anxiety

## INTRODUCTION

Body dysmorphic disorder (BDD) is a psychopathology characterized by excessive preoccupation with unreal or exaggerated body-related defects (1). This excessive preoccupation has led to the classification of BDD as a disorder related to obsessive-compulsive disorders with recent regulations (1). It is known that genetic factors (approximately 43%) as well as environmental effects such as exposure to bullying and abuse in childhood play a role in the emergence of BDD (2). Although it is more common in women (2.1%-1.6%), higher prevalence of BDD is reported in various clinical groups compared to the general population (1.9%): For example, 7.4% in psychiatric patients

and 9.2-13.2% in general cosmetic surgery patients (3). It is noteworthy that prevalence values are considerably higher in rhinoplasty clinics (20.7%), and these results suggest that this clinical sample is an important population to be studied in relation to both BDD and other related processes (3).

The fact that the face is the most visible body region in social interactions may explain why people with BDD prefer surgical interventions related to the face and aesthetic operations for the nose more among these interventions (4). This situation may cause clinically unfavorable surgical results and problems. Rhinoplasty patients with BDD may request inappropriate additional interventions, which may lead to legal problems and/or

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these patients may exhibit various forms of violent behavior against specialists (5,6). In addition to all these potential problems, the operations may also have negative psychological consequences for patients (5). Furthermore, when the clinical profiles of individuals with BDD are examined, it is observed that other psychopathologies frequently co-exist. In particular, comorbid anxiety disorders and depression with BDD may prevent the diagnosis of BDD and the application of appropriate treatment protocols. These individuals are mostly diagnosed with social anxiety disorder, major depressive disorder and obsessive-compulsive disorder by overlooking the underlying BDD (7).

In addition to the fact that comorbid psychopathologies may mask the diagnosis of BDD, they may also have negative effects on the clinical presentation of BDD. In particular, the relationship of BDD with anxiety and depression stands out in studies conducted on both clinical and non-clinical samples and its possible effects are examined (7, 8). For example, it has been observed that comorbid anxiety with BDD is a risk factor for impaired functionality of individuals and increase the risk of major depressive disorder (9,10). Anxiety has also been reported to be associated with poor quality of life and high depression scores accompanying BDD (11). These findings are similar in cosmetic surgery patients. High anxiety and depression scores were recorded in cosmetic surgery patients diagnosed with BDD and a more significant relationship was observed between these scores compared to non-clinical comparison groups (4). However, it is known that these results are mixed in rhinoplasty patients although the prevalence of BDD is quite high. More studies are needed to understand the relationship between BDD and depression and anxiety symptoms (12).

It may be thought that the role of self-esteem may be enlightening in examining the relationship between depression and anxiety symptoms comorbid with BDD. Previous studies examining the effect of shame on BDD (13) indicate that comorbid depression, suicidal tendency and impairments in functionality are more common in cases where shame exceeds body image and characterizes the self as worthless or defective. A similar situation may also explain the relationship between BDD,

anxiety and depression; therefore, self-esteem may explain the complex comorbidity profile seen in this group. Indeed, the relationship between high BDD symptom severity and low self-esteem shows that people with BDD evaluate not only their bodies but also their selves negatively. Moreover, it seems that the relationship between BDD and self-esteem cannot be explained only by possible depression symptoms (14). Studies conducted in non-clinical samples also draw attention to the relationship between high BDD symptoms and high anxiety/depression and low self-esteem (15, 16).

This study aims to test a model explaining the relationship between BDD and depression symptoms through self-esteem and anxiety symptoms in a sample of rhinoplasty patients and a non-clinical control group of healthy participants. The hypotheses of the study are that the symptoms of BDD are higher in rhinoplasty patients compared to healthy participants and that the relationship between BDD and depression symptoms can be explained by the mediating role of self-esteem and anxiety symptoms. It is thought that the results of the study will contribute to the inconsistent literature on the psychopathological profiles of rhinoplasty patients. The possible mediating role of self-esteem may help to understand the complex relationship between depression and anxiety symptoms associated with BDD and guide treatment approaches for this group.

## METHOD

Within the scope of the study, which was reviewed and approved by the Ethics Commission of Gazi University Faculty of Medicine, 50 patients who were planned to undergo rhinoplasty between February 2022 and February 2023 and 42 healthy participants to be included in the control group were reached. The rhinoplasty group consisted of people who applied to Ankara Gazi University Faculty of Medicine Hospital Otorhinolaryngology outpatient clinic for rhinoplasty surgery on the specified dates and gave written voluntary consent to participate in the study. Exclusion criteria for the rhinoplasty group were patients with pathologies other than septonasal deformity (nasal and paranasal sinus neoplasms, other surgical indica-

**Table 1.** Demographic profiles of rhinoplasty and control groups: Mean (sd) / number of people (%)

		Rhinoplasty (n=50)	Control (n=42)	$\chi^2$	df	p
Age <sup>a</sup>		28.06(7.87)	28.10(7.24)	-	-	.99
		18-54	18-44			
Gender	Female	23 (%46)	18 (%43)	0.09	1	.84
	Male	27 (%54)	24 (%57)			
Level of education	Primary/Secondary School	11 (%22)	10 (%24)	0.17	2	.93
	High school	15 (%30)	11 (%26)			
	University/above	24 (%48)	21 (%50)			
Marital status <sup>b</sup>	Single (never married)	28 (%56)	26 (%62)	-	-	.88
	Married	19 (%38)	14 (%33)			
	Divorced/Separated	3 (%6)	2 (%5)			
Job Status	Working	33 (%66)	29 (%69)	0.10	1	.83
	Not working	17 (%34)	13 (%31)			
History of psychiatric treatment	Yes	4 (%8)	8 (%19)	2.46	1	0.13
	No	46 (%92)	34 (%81)			

<sup>a</sup> $t(90)=0.02$ ,  $d=.01$  (Bootstrapped t-test); <sup>b</sup>Fisher's exact test

tions related to the paranasal sinus, nasopharyngeal pathologies causing nasal obstruction, etc.) and known psychiatric or neurological disorders. The healthy control group who had no nasal symptoms, had not undergone rhinoplasty or similar plastic surgery before, and had no known psychiatric or neurological disorders voluntarily participated in the study via social media and announcements made at Ankara Hacı Bayram Veli University and Social Sciences University of Ankara. Demographic information of the participants is presented in Table 1.

## Scales

All participants were given a demographic information form prepared by the researchers asking information such as age, education level, employment status, marital status and psychiatric history. The Yale-Brown Obsessive Compulsive Scale Modified for Body Dysmorphic Disorder (BDD-YBOCS) was used to measure BDD symptoms (17, 18). Consisting of 12 items and having a semi-structured structure, the BDD-YBOCS is a Likert-type scale in which BDD symptoms are evaluated between 0 and 4. According to the results of the Turkish validity and reliability study, the scale has high validity and reliability values (18). The Hospital Anxiety and Depression Scale (HADS) was used to measure anxiety and depression symptoms of the participants (19, 20). It is known that the scale, which has good/very good Turkish validity and reliability, has been used in the literature to measure anxiety and depression symptoms in both clinical and non-

clinical samples. The questions about anxiety and depression symptoms, which are seven items each, are evaluated with 4-point Likert-type options. In the measurement of self-esteem, the Self-Esteem subscale of the Rosenberg Self-Esteem Scale (RSES), which consists of the first ten questions and has a 3-point Likert-type scoring, was used (21, 22). In the Turkish validity and reliability study of the RSES, which has long been used in the literature to measure self-esteem, it was reported that the relevant values were at a good level (21). 'Participants also completed a one question subjective assessment of nasal appearance on a scale of 0 (very unpleasant) to 7 (very pleasant), which allowed them to evaluate their own noses.

## Statistical analysis

SPSS 25 program and PROCESS Macro plug-in were used for data analysis. The demographic information, self-esteem, anxiety and depression scores of the participants in the rhinoplasty and control groups were compared using Chi square/Fisher's Exact test and t-test (by applying Bootstrap in nonparametric cases). Pearson's r or Spearman's rho values were used to examine the relationships between variables. Hayes' model number 6 was applied to test the mediating role of self-esteem and anxiety scores in the relationship between BDD and depression.

**Table 2.** Scores of BDD (BDD-YBOCS), anxiety and depression (HADS), self-esteem (RSES), and subjective nasal appearance assessment of the rhinoplasty and control groups: Mean (sd) / number of people (%)

	Rhinoplasty (n=50)	Control (n=42)	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
BDD	14.64 (8.54)	9.38 (7.10)	-3.18	90	.002**	.67
Anxiety	7.44 (4.19)	7.33 (3.71)	-0.13	90	.90	.03
Depression <sup>a</sup>	5.90 (3.27)	5.48 (3.61)	-0.59	90	.58	.12
Self-esteem <sup>a,b</sup>	0.99 (0.69)	1.08 (0.74)	0.61	90	.54	.13
Subjective evaluation of nasal appearance <sup>c</sup>	3.18 (1.49)	4.45 (1.69)	3.84	90	<.001	.80

<sup>a</sup> Bootstrapped t-test; <sup>b</sup> Higher score=Lower self-esteem**RESULTS**

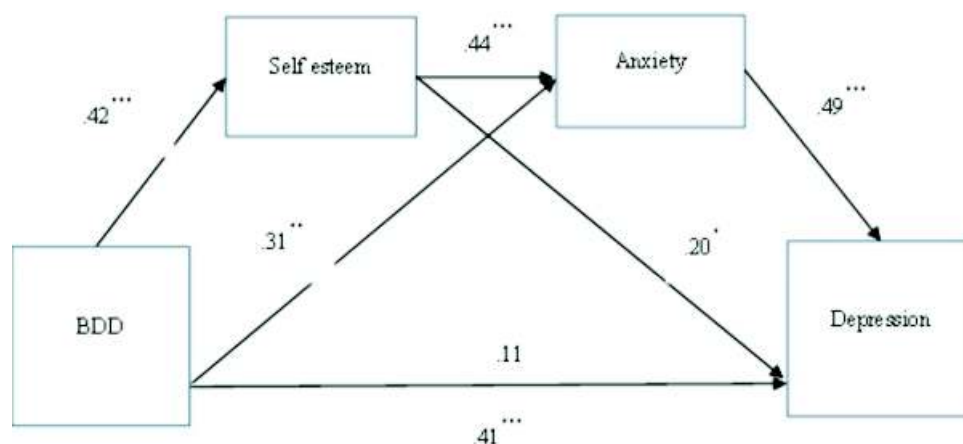
There was no significant difference between the rhinoplasty and control groups in terms of demographic characteristics (Table 1).

It was observed that the BDD-YBOCS scores of the rhinoplasty group were significantly higher than those of the control group ( $p=.002$ ). As expected, the rhinoplasty group found their noses subjectively uglier than the control group ( $p<.001$ ). There was no significant difference between the anxiety ( $p=.90$ ), depression ( $p=.58$ ) and self-esteem ( $p=.54$ ) scores of the study groups as assessed by the HADS and RSES-Self Esteem subscale, respectively (Table 2).

When the relationships between the variables were examined, significant correlation values were found between BDD, anxiety, depression and self-esteem scores in both rhinoplasty and control groups

(Table 3). Accordingly, in both groups, high BDD symptom levels seem to be associated with high anxiety and depression scores and low self-esteem.

The mediation model examining the mediating role of self-esteem and anxiety level on the relationship between BDD and depression scores was found to be significant independent of the study group ( $F(4,87)=8.69$ ,  $p<.001$ ,  $R^2=.47$ ). All variables in the model were significantly related as expected (Figure 1). However, the significant relationship between BDD and depression symptoms ( $t(89)=4.29$ ,  $p<.001$ ), which was found when the effect of mediating variables was not controlled, became insignificant with the mediating role of self-worth and anxiety scores, respectively ( $t(87)=1.11$ ,  $p=.27$ ). The results suggest that low self-esteem in relation to symptoms of BDD may be associated with high anxiety symptoms and thus high depressive symptoms (Figure 1).

**Figure 1.** Standardized regression coefficients for the model explaining the mediating role of self-esteem (RSES) and anxiety (HADS) symptoms in the relationship between BDD (BDD-YBOCS) and depression (HADS) symptoms. \* $p<.05$ , \*\* $p<.01$ , \*\*\* $p<.001$

**Table 3.** Correlations between BDD (BDD-YBOCS), anxiety and depression (HADS), and self-esteem (RSES) scores of the rhinoplasty and control groups: Pearson  $s r$  / Spearman  $s rho$

		BDD	Anxiety	Depression	Self-esteem <sup>a</sup>
	Rhinoplasty	Rhinoplasty	Rhinoplasty	Rhinoplasty	Rhinoplasty
	Control	Control	Control	Control	Control
BDD	Rhinoplasty		.44**	.28*	.36 <sup>ab</sup>
	Control		.56***	.49***b	.37 <sup>ab</sup>
Anxiety	Rhinoplasty			.58***	.40***b
	Control			.67***b	.62***b
Depression	Rhinoplasty				.42***b
	Control				.50***b
Self-esteem <sup>a</sup>	Rhinoplasty				
	Control				

<sup>a</sup> High score = low self-esteem; <sup>b</sup> Spearman  $s rho$ .

## DISCUSSION

This study provides significant results that the relationship between BDD and depression symptoms can be explained by the mediating role of self-esteem and anxiety symptoms. In addition to helping to understand the relationship between symptoms of BDD and depression, these results indicate that anxiety symptoms, which are frequently associated with BDD, may be related to an experience of self-worthlessness beyond the body in these individuals.

As expected, the results confirmed that rhinoplasty patients had higher levels of BDD symptoms compared to the control group. In a recent systematic review study, it was suggested that inconsistent results regarding anxiety and depression findings in rhinoplasty patients seen in the literature may be related to the effect of possible BDD symptoms (12). This suggestion is also supported by the results of the present study. The relationship of BDD symptoms, which are highly likely to be present especially in rhinoplasty patients, with anxiety and depression symptoms through low self-worth as well as loss of body-related self-confidence may facilitate the understanding of the psychiatric clinical profile in this group.

The findings of the study are consistent with the results of Weingarden and colleagues (13), who previously examined the mediating role of shame in

the relationship between BDD and depression, suicide risk and functioning. In the aforementioned study, the researchers suggested that a body-oriented shame may be more highly associated with BDD as expected, while a generalized sense of shame may be more highly associated with some of the negative psychosocial outcomes associated with BDD. It is conceivable that such generalized shame may be associated with low self-esteem, thereby explaining the comorbidities that often accompany BDD, such as anxiety and depression. As a matter of fact, the model proposed in this study supports a relationship mechanism in which low self-esteem accompanying symptoms of BDD is associated with higher anxiety and depressive symptoms. Thus, the findings point to important implications regarding the role of anxiety disorders besides depression in the relationship mediated by a worthlessness schema that extends beyond the body.

It can be seen that this model, which helps to understand the relationship between BDD and comorbid psychopathologies such as anxiety and depression, which are frequently seen together, is similar to the vulnerability model of depression (23). According to this model, beliefs that the self is worthless for some reason predict susceptibility to depressive symptoms. Orth and Robins (23) suggest that negative outcomes related to interpersonal relationships (social avoidance, etc.), one of the possible mediating variables in the relationship between low self-worth and depression, should be included in the vulnerability model and the model

in question should be examined in more detail. All these findings and suggestions indicate that there is a need for further studies on the mechanism of anxiety symptoms that mediate the relationship between BDD and depression together with low self-worth.

The results of the study also draw attention to a number of implications that can be used in clinical practice. The predisposition of rhinoplasty patients to BDD and related additional psychopathological symptoms points to the importance of including psychiatric evaluations in clinical protocols. Adding interventions aimed at improving self-worth to clinical practices for individuals with low self-esteem in BDD groups may be helpful in combating anxiety and depressive symptoms (24). In particular, working with the beliefs of individuals with BDD with low self-worth about subjective devaluation with compassion-based practices may have positive effects on appearance-related comorbidity and functioning (6). Randomized controlled studies on this subject are needed.

There may be several reasons why the proposed model is valid in both rhinoplasty and control groups. For example, it is seen that the control group included in the study was quite similar to the rhinoplasty group except for the symptoms of BDD. In addition, participants in the rhinoplasty group did not undergo any psychiatric evaluation. In other words, although the symptoms of BDD were significantly higher, the participants in the rhinoplasty group did not represent any clinical diagnostic group. This suggests that the self-esteem and anxiety symptoms-mediated model explaining the relationship between BDD and depression may be a generally valid model. Consistent results from non-clinical samples regarding the relationship between BDD, self-esteem and depression make this inference highly probable (14). Future studies may contribute to the literature on the extent of its validity by testing the model in different sample groups, both clinical and non-clinical.

The cross-sectional design, relatively small and non-clinical sample in terms of psychopathology can be considered among the limitations of the study. Future studies can test the validity of the results on clinically diagnosed groups, preferably with longitudinal designs. Furthermore, the role of

other possible mediators pointed out in the literature (e.g., shame, 25) in the relationship between BDD and depression could be investigated using more complex models. The results of the study also suggest that suicidality observed with or alongside depression (26, 27), which may be explained by similar models in BDD groups, could be examined by future studies with groups of appropriate size and quality. The theory that symptoms of BDD and the accompanying generalized self-devaluation perception may lead to depressive symptoms through avoidance of social relationships and activities, as pointed out by previous shame studies (11, 13), suggests whether the anxiety symptoms included in the model can rather be explained by social anxiety symptoms. The possible effects of demographic characteristics such as age and gender can also be tested with customized models and designs thus contribute to testing the validity of the relevant model. Longitudinal designs can be considered as quite appropriate especially for the investigation of age and accompanying psychosocial factors. In the literature, the need for longitudinal studies especially on symptoms of BDD and self-esteem draws attention. There is a need for such studies to test models that will make a great contribution to the field by including other possible factors.

In conclusion, understanding the symptoms of depression and anxiety that can be seen together with symptoms of BDD in high-risk groups such as rhinoplasty patients is valuable in terms of developing and implementing efficient treatment protocols as well as being useful in dealing with possible problems in clinical practice. In groups with high BDD symptoms, the predisposition of individuals to high anxiety with a perception of worthlessness that extends from the body to the self and ultimately to comorbid psychopathologies such as depression, which have a negative impact on quality of life and functionality, reveals the importance of carefully evaluating these findings and putting them on the agenda.

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# Reliability and validity of the Binge Eating Scale-Turkish Form

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## SUMMARY

**Objective:** Binge Eating Disorder (BED) is defined in the DSM-5 as “consuming more food than most people can eat in a given period of time with an accompanying feeling of loss of control”. Although BED has only recently been defined as a distinct diagnostic category, studies show that it is the most common eating disorder in adults. Therefore, the measurement tools that can be used in the assessment of BED gain importance at this point. The aim of this study was to determine the psychometric properties of the Binge Eating Scale, which was developed by Gormally et al.(44) and used in the assessment of BED, by adapting it into Turkish.

**Method:** The study was conducted on two separate samples of individuals between the ages of 18-65/68. The second sample was used only for confirmatory factor analysis. The Eating Attitudes Test, Brief Symptom Inventory and Brief Self-Control Scale were used as criterion-related validity criteria.

**Results:** As a result of the exploratory factor analysis, it was seen that the scale had a single-factor structure. This single-factor structure explained 32.69% of the variance. The goodness of fit values obtained from confirmatory factor analysis were also found to be excellent and acceptable (e.g.,  $\chi^2/sd = 2.93$ ). The Cronbach's alpha reliability coefficient of the scale was found to be .85, and the Spearman Brown two-half reliability coefficient was found to be .76 ( $p < .001$ ).

**Discussion:** The results of the statistical analysis show that the Turkish adaptation of the scale is valid and reliable.

**Key Words:** Binge Eating Disorder, Validity, Reliability

## INTRODUCTION

The aim of this study was to adapt the Binge Eating Scale to our culture and to conduct validity and reliability studies. Binge eating disorder (BED) is defined in DSM-5 as “consuming more food than many people can eat in a given period of time with an accompanying feeling of loss of control” (1). Although it has only recently been defined as a specific diagnostic category, studies show that it is the most common eating disorder in adults (2,3,4).

According to DSM 5, for a binge eating behavior to be considered as a binge eating episode, this behavior should be accompanied by a feeling of loss of control (1,5). Sometimes, although the amount of food consumed during a binge eating attack is not

more than many people can eat in a certain period of time, people may perceive a loss of control over their eating behavior. When the amount of food consumed during binge eating is more than many people can consume in a certain period of time, it is defined as “objective binge eating”; when the individual perceives loss of control over eating even though the amount is not too much, it is defined as “subjective binge eating” (6).

The main feature that distinguishes binge eating disorder from bulimia nervosa (BN) is that recurrent binge eating episodes occur without compensatory behaviors such as vomiting, use of laxatives, excessive exercise or overly restrictive dieting to prevent the effects of a binge eating episode (1). Although individuals with binge eating disorder also report frequent diet attempts, they do not fol-

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low an overly restrictive diet between binge eating episodes as in bulimia nervosa (7,8). In BN, an overly restrictive diet usually triggers a binge eating episode, whereas in BED, binge eating behavior usually starts first, followed by diet attempts (9,10,11). Calorie intake and the type of food consumed during a binge eating episode also differ in BN and BED. A laboratory study showed that individuals with BN consumed twice as many calories as individuals with BED during a binge eating episode (12). It has also been reported that individuals with BED have less anxiety about their eating behaviors and body appearance, feel less guilt about being overweight and are more socially compatible than individuals with BN (13).

It is thought that the most common initiator of binge eating behavior in BED is negative affect (14). Interpersonal stress, negative feelings about weight, body shape or food, dietary restriction and boredom are also considered among the factors that trigger binge eating behavior (15,16,17). Although binge eating may lead to a short-term reduction or improvement in these triggering factors, especially emotions, in the long term it usually leads to discomfort and negative self-evaluations (18).

Although binge eating behavior can be observed in people of any weight (19), it is known to be more common in overweight and obese individuals (2). The rate of obesity in individuals with BED is 2-fold increased compared to the normal sample (20). However, binge eating disorder and obesity are two different conditions (21). Although obesity rates are very high in the society (>66%), only 2-3% of people meet the diagnosis of BED (2). Although binge eating behavior is occasionally observed in some obese individuals, most of them do not exhibit repetitive binge eating behavior (22).

Studies on the prevalence of eating disorders show that BED is the most common eating disorder in adults (2,3,23,24). Increasing obesity and obesity-related mortality rates both in Turkey and in the world make BED and binge eating behavior a common and serious public health problem (25,26). For these reasons, it can be said that it is important to evaluate binge eating behavior. When the literature

is examined, it is seen that many scales have been developed to measure eating behaviors and eating disorders in general and these scales have been adapted into Turkish. Eating Attitude Test (27,28), Dutch Eating Behavior Questionnaire (29,30), Three-Factor Eating Questionnaire (31,32), Yale Food Addiction Scale (33,34), Emotional Appetite Questionnaire (35,36), BITE-Edinburg Test (37,38), Eating Awareness Scale (39,40) and Eating Disorder Assessment Questionnaire (41,42,43) are among these. When these measurement tools that have been studied in our country are examined, it is seen that binge eating behavior is either not included at all or evaluated with a few open-ended questions (41,42,43). Abroad, the most frequently used scale in the evaluation of binge eating behavior is the Binge Eating Scale (BES) developed by Gormally, Black, Daston, and Rardin in 1982 (44). This scale, which was used to assess binge eating behavior in obese and overweight individuals before the diagnosis of BED was developed, is currently used to assess behavioral, cognitive and emotional characteristics related to binge eating behavior in clinical and normal samples. It has been adapted into many languages such as Italian (45), Arabic (46), Spanish (47), Portuguese (48), Chinese (49) and Malay (50). In these adaptation studies, a single-factor structure was determined and its psychometric properties were found to be quite satisfactory.

As can be understood from all of the above, there is no scale that directly assesses binge eating behaviors in our country. Therefore, the aim of the present study is to conduct adaptation and validity and reliability studies of the Binge Eating Scale, which was developed by Gormally, Black, Daston, and Rardin (44) to assess binge eating behavior and is frequently used abroad. For this purpose, the Turkish translation study of the scale was conducted first. Then, construct validity was tested with exploratory and confirmatory factor analyses, and criterion-related validity analyses were also conducted. For reliability values, Cronbach alpha internal consistency and Spearman-Brown two-half reliability correlation coefficients were calculated.

## METHOD

### Sample

The current study was conducted on two separate samples. The first sample consisted of 397 adults between the ages of 18-68 (mean=33.99, SD=12.51) residing in Turkey, and the second sample consisted of 858 adults between the ages of 18-65 (mean=33.58, SD=12.54) residing in Turkey. These individuals were reached through convenience sampling technique. The second sample was used only for confirmatory factor analysis and all other analyses were conducted on the first sample. Detailed information about the characteristics of both samples is given in Table 1.

### Data Collection Tools

**Demographic Information Form:** It is a form prepared by the researchers to determine the demographic characteristics of the participants such as age, gender, education level and eating-related characteristics (height, weight, eating frequency, etc.).

**Binge Eating Scale (BES):** It was developed by Gormally, Black, Daston and Rardin (44). It is a self-report scale consisting of a total of 16 items. For each item, the participants are asked to choose one of the three or four appropriate responses. Items 6 and 16 of the scale have three responses (scoring between 0-2) and the other items have four responses (scoring between 0-3). In the scale, 8 items describe emotions and cognitions related to binge eating (e.g. guilt, feeling loss of control), while 8 items describe behaviors (e.g. fast eating, secret eating). The Turkish version of the scale was prepared in accordance with the original. High scores obtained from the scale consisting of a single factor indicate an increase in the severity of binge eating. The internal consistency coefficient of the original form was .85 and the test-retest reliability coefficient was .87 (44).

**Eating Attitude Test (EAT):** It is a 6-point Likert-type scale (1=always, 6=never) developed by Garner and Garfinkel to evaluate the symptoms of

anorexia nervosa (27). The Cronbach alpha value of the original scale was reported as .79 for the clinical diagnosis group. Turkish adaptation of the scale was conducted by Savaşır and Erol and as a result of the factor analysis, a 3-factor structure was found as “diet-regime”, “obesity anxiety-overly preoccupied with obesity”, “social pressure and overly preoccupied with thinness”. In the adaptation study, the test-retest reliability calculated for the whole scale was .65 and Cronbach's alpha internal consistency coefficient was .70 (28). The scale is also widely used to assess impairments in eating attitudes and behaviors in normal samples. The Cronbach's alpha internal consistency coefficient of the scale calculated in the present study was .85.

**Brief Symptom Inventory (BSI):** It is a 53-item Likert-type scale (0=none, 4=very much) developed by Derogatis (51). The higher the scores obtained from the scale, the higher the frequency of the individual's psychological symptoms. As a result of the adaptation of the scale to our culture, a five-factor structure including “anxiety”, “depression”, “negative self”, “somatization” and “hostility” was obtained and the Cronbach's alpha internal

**Table 1.** Demographic characteristics of the participants

	1.Sample		2.Sample	
	N	%	N	%
<b>Sex</b>				
Female	228	57.4	523	61
Male	168	42.3	335	39
<b>Education</b>				
Primary school	18	4.6	10	1.2
High school	55	13.9	104	12.1
University student	134	33.9	239	27.9
University graduate	127	32	291	33.9
Postgraduate	60	15.2	214	24.9
<b>Marital status</b>				
Single	193	49	443	51.6
Married	179	45.4	373	43.5
Lost his/her wife	6	1.5	10	1.2
Divorced/Separated	16	4.1	32	3.7
<b>Whom Lives With</b>				
Alone	52	13.2	96	11.2
With family	318	80.5	705	82.4
Friend/Relative/Other	25	6.3	55	6.4
<b>Income Level (Perceived)</b>				
Lower	6	1.5	17	2.0
Lower-middle	20	5.1	83	9.7
Middle	214	54.2	438	51.2
Upper-middle	134	33.9	274	32
Upper	21	5.3	44	5.1
<b>Body Mass Index (BMI)*</b>				
Underweight (18.50 ve alt )	22	5.6	51	5.9
Normal Weight (18.50-24.99)	209	53.6	452	52.7
Overweight (25-29.99)	110	28.2	263	30.7
1st Degree Obese (30-34.99)	46	11.8	77	9.1
2nd Degree Obese (35-39.99)	3	0.8	13	1.5
3rd Degree Obese (40 and above)	-	-	2	0.2

\* Based on the classification made by the World Health Organization.

consistency coefficients of the subscales ranged between .87 and .75 (52). In the present study, the Cronbach's alpha internal consistency coefficient of the scale was calculated as .96.

**Brief Self-Control Scale (BSCS):** It is a 13-item scale developed by Tangney, Baumesiter and Boone and scored on a Likert-type scale (1= completely contrary, 5= completely appropriate). An increase in the scores obtained from the scale indicates low self-control. The scale consists of a single-factor structure and its internal consistency coefficient is .85 and test-retest reliability coefficient is .87 (53). Turkish adaptation study was conducted by Nebioğlu, Konuk, Akbaba, and Eroğlu and a two-factor structure named as self-discipline (Cronbach alpha= .81) and impulsivity (Cronbach alpha= .87) was reported (54). In the present study, the Cronbach alpha internal consistency coefficient of the scale was calculated as .81.

### Procedure

Before starting the study, the necessary permission was obtained from the Ethics Committee of the relevant university (Date: 09.12.2019, Decision No: 14/415). The scale was translated into Turkish by 3 clinical psychologists who are fluent in both languages, then these translations were brought together and the most appropriate equivalents for each item were determined by the researchers. The items were finalized by taking the opinions of 3 other experts in the field of clinical psychology regarding the suitability of the translated items.

For both samples, approximately 70% of the data were collected through a paper and pencil test given to the volunteer participants in a sealed envelope, and approximately 30% of the data were collected online. Exploratory factor analysis and other validity and reliability analyses were conducted on the first sample (N=397), while confirmatory factor analysis was conducted on the second sample (N=858). The website [www.surveey.com](http://www.surveey.com) was utilized for online data collection. The participants were first given the Informed Consent Form, and the other scales were presented to the participants in different orders to avoid the order effect.

Before proceeding to the analysis phase, the data were cleaned and tested for suitability for statistical analysis. The z scores of the dependent variables ( $-3.29 < z < 3.29$ ) were calculated to determine the univariate outliers in the data set, and the Mahalanobis Distance (D2) value ( $\chi^2(5)=11.07$ ,  $p < .001$ ) was calculated to determine the multivariate outliers. Skewness and kurtosis levels were examined to evaluate whether the assumption of normal distribution was met. Since the skewness and kurtosis values of the variables met the condition of being between -2 and +2, parametric tests were used in the analysis (George & Mallery, 2010). The data were analyzed using SPSS 23 and LISREL 8.51 programs. Exploratory and confirmatory factor analysis were used to determine the construct validity of the scale, and correlation analysis was used for criterion-related validity and reliability values.

### RESULTS

#### *Construct Validity: Exploratory Factor Analysis*

Exploratory factor analysis (EFA) was conducted to examine the construct validity of the Binge Eating Scale (BES). The Kaiser-Meyer-Olkin (KMO) value and the chi-square value in Bartlett Sphericity test, which were examined to evaluate whether the data were suitable for factor analysis, revealed that the data were suitable for factor analysis (KMO= .92,  $\chi^2=1535.68$ ,  $p > 0.001$ ). The results of the initial factor analysis using principal component analysis and Varimax transformation suggested three factors with eigenvalues higher than 1 and explaining 46.48% of the variance. In order to decide on the number of factors, a parallel analysis was also conducted. The eigenvalue results obtained from the parallel analysis were compared with the eigenvalue results obtained from the principal components analysis and if the eigenvalue results obtained from the principal components analysis were higher, that factor was accepted. The parallel analysis results indicated a single-factor structure. Since the original scale and the versions of the scale used in other languages were also single-factor and the factors did not diverge significantly, it was decided to treat the scale as a single factor and the principal components analysis was

**Table 2.** Binge Eating Scale (BES) factor structure

Item No	Factor Loadings	Item Total r
10	.74	.66***
3.	.70	.61***
11.	.66	.57***
16.	.64	.56***
14.	.61	.52***
9.	.61	.53***
8.	.58	.49***
15.	.57	.47***
5.	.56	.47***
4.	.55	.47***
6.	.54	.46***
7.	.54	.45***
13.	.46	.39***
12.	.44	.37**
1.	.44	.37**
2.	.39	.31**
Explained variance (%)	32.69	
Eigenvalue	5.23	
Cronbach Alfa	.85	

\*\*p&lt; .01 \*\*\*p&lt; .001

performed again by forcing the scale into a single factor. The single-factor structure explains 32.69% of the variance. The factor loadings of the items, item-total correlations, Cronbach's alpha internal consistency coefficient, variance explained and eigenvalue are presented in Table 2.

#### Construct Validity: Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was conducted using the Lisrel 8.51 program to confirm the single-factor structure of the BES obtained as a result of the exploratory factor analysis. The results of the first model tested revealed that 16 items loaded significantly on a single factor ( $p < .001$ ) and the model showed a good fit to the data. In line with the modification suggestions, the model was reanalyzed by correlating the error variances of items 4 and 5 and items 1 and 6. After each error association, the models were compared with the Chi-square difference test ( $\chi^2$  difference test). The results of the comparison revealed that the model became more compatible after the error associations. The goodness of fit values for the compared models are given in Table 3, and the factorial model of the scale and the standardized coefficients for the factor-item relationship are given in Figure 1.

**Table 3.** BES Goodness of Fit Values

	$\chi^2$ /sd	CFI	NFI	GFI	AGFI	RMSEA
First Model	3.54	.95	.93	.95	.93	.054
Latest Model (Two errors are associated)	2.93	.96	.94	.96	.94	.048

#### Criterion-Related Validity

In order to evaluate the criterion-related validity of the BES, its correlations with the EAT, BSI, and BSCC were examined. The correlation results showed that the correlation coefficients ranging from .32 ( $p < .01$ ) to .44 ( $p < .001$ ) with the other scales (See Table 4).

#### Reliability Findings

In order to assess reliability, Cronbach's alpha internal consistency coefficient, item-total correlations and two-half reliability were calculated. The Cronbach's alpha internal consistency coefficient was calculated as .85, which was consistent with the original scale. Item-total correlations were found to be in the expected direction and between .31 ( $p < .01$ ) and .66 ( $p < .001$ ) (See Table 1). The Spearman-Brown two-half reliability correlation coefficient, which was calculated by separating the items into odd and even, was found to be .76 ( $p < .001$ ).

## DISCUSSION

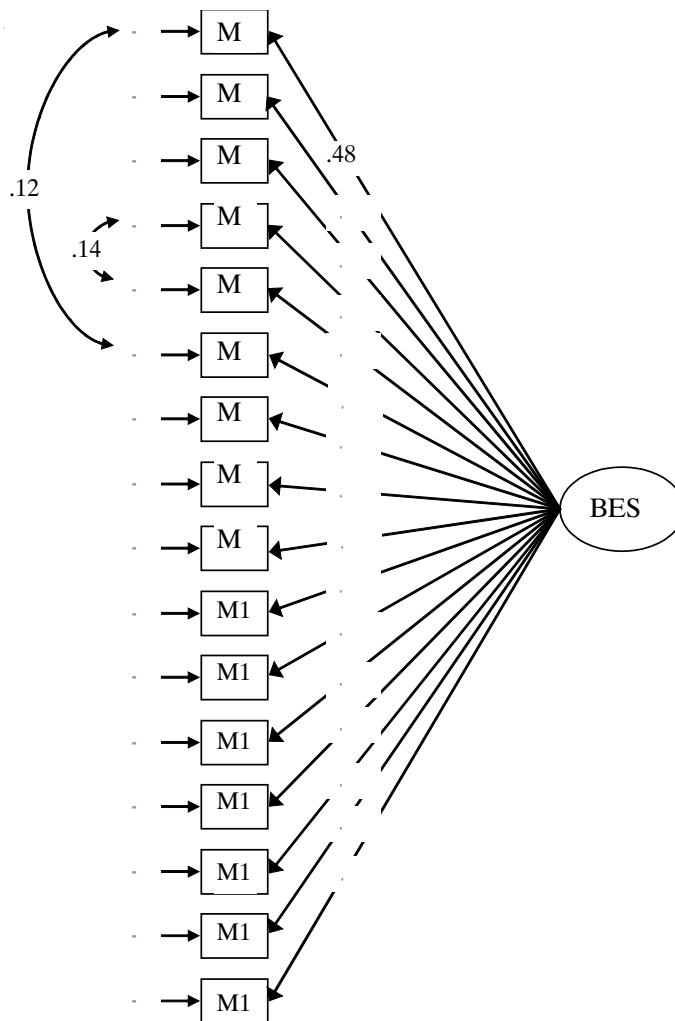
When the above-mentioned findings are evaluated, it can be said that the BES, which consists of 16 items, is a valid and reliable scale. As a result of EFA, it is seen that the items loaded on a single factor with high coefficients. As it is known, the factor loading value is a coefficient that explains the relationship between the items and the factors, and a high factor loading value indicates that the item has a strong relationship with the factor in question. These loadings of .30 and above are considered sufficient (55). As a result of the factor analysis conducted for the BES, the lowest factor loading was .39 (Item 2).

The CFA was conducted on a different sample (Sample II) than the EFA. When the related literature is examined, testing the EFA results with

**Table 4.** Correlation coefficients between BES total score and other scales

	2	3	4
1. Binge Eating Scale (BES)	.37**	.32**	.44***
2. Eating Attitude Test (EAT)	-	.19**	.12*
3. Brief Symptom Inventory (BSI)		-	.47***
4. Brief Self-Control Scale (BSCC)			-

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Figure 1.** BES Confirmatory Factor Analysis Results

another sample is a frequently recommended and practiced method (56,57). During CFA, the error variances of the items were correlated in line with the recommendations of the model. While correlating the error variances, correction suggestions were taken into consideration and the correlation was started from the modification index value that would give the biggest change (58).

During CFA, some values are used to test the fit of the data. The most important of these is the ratio of  $\chi^2$  to degrees of freedom ( $\chi^2/\text{sd}$ ). A ratio below 3 is considered to be an excellent fit, while a ratio below 5 is considered to be an acceptable fit (59). Other criteria used to evaluate the fit of the data are CFI (Comparative Fit Index), GFI (Goodness of Fit Index), NFI (Normed Fit Index), AGFI (Adjustment Goodness of Fit Index) and RMSEA (Root Mean Square of Approximation). .08 and below for RMSEA (60), .90 and above for NFI and

CFI, and .85 and above for GFI (61) are shown as acceptable values. It is noteworthy that especially the  $\chi^2/\text{sd}$  ratio is excellent in the present study. In addition, other values are also within acceptable limits.

Correlation analyses conducted to assess criterion-related validity provided evidence for the criterion-related validity of the scale by showing that there were significant relationships between the EAT and other scales in the expected direction. Accordingly, as individuals' binge eating behaviors increase, the deterioration in their eating attitudes and psychological symptoms increase, and their perceived self-control decreases. These findings are consistent with the literature. For example, Alvarenga et al. reported that eating attitudes deteriorated as binge eating behavior increased (62). In addition, there are studies showing that there is a relationship between binge eating behavior and general psychological symptoms (63); binge eating disorder is accompanied by high levels of other psychopathologies (2,64) and binge eating is associated with a decrease in self-control in general (65).

The Cronbach's alpha reliability coefficient of the single factor obtained is .85. In psychological research, .70 and above is generally accepted as a satisfactory value (66). Therefore, it can be said that the scale has a high internal consistency coefficient. The item-total correlation coefficients of the scale are also satisfactory. It is stated that these coefficients should generally be .30 and above (67). As seen in Table 2, the coefficients obtained are above this value. Another method that can be used to determine the reliability of scales is the halving method (68). The correlation coefficient between the two half-tests formed from the single and double items of the scale also provided additional information about the reliability of the scale.

As a result, it can be concluded that the BES is a valid and reliable instrument. The low number of items, ease of scoring and interpretation make the scale practical for studies in clinical psychology and health psychology. In addition, considering the limited number of studies on binge eating in Turkey and the lack of a measurement tool that directly

measures binge eating behavior, it can be said that this scale will fill an important gap in the field.

This study has some limitations. First of all, since the sample was formed with the convenience sampling method, the representativeness of the population is low. In addition, the cross-sectional nature of the study does not allow causal inferences to be made. The fact that the data were collected with self-report scales creates limitations such as giving socially desirable answers, response bias, and misremembering. In particular, the fact that the information about eating behavior is based on self-report suggests that it may create limitations due to situations such as participants' low awareness of the behavior or denial. In addition to all these, the

validity results of the BES were determined not on individuals diagnosed with binge eating disorder, but on secondary criteria such as the Eating Attitude Test, Brief Symptom Inventory and Brief Self-Control Scale. This did not allow the development of cut-off scores required for the practical use of the scale. This can be considered as an important limitation of the study.

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# Relationship between positive mental health and quality of work life in nurses

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## SUMMARY

**Objective:** This study was conducted to evaluate positive mental health and quality of work life levels of nurses working in hospitals in terms of personal and work-related factors and to examine the relationship between positive mental health and quality of work life.

**Method:** This descriptive and correlational study was conducted with 247 nurses working in three public hospitals. The data were collected using an introductory information form, the Positive Mental Health Scale and the Quality of Nursing Work Life Survey. Statistical analyses were performed using a software package (Kruskal-Wallis H test, Independent Sample-t test, ANOVA test, Spearman Correlation Analysis).

**Results:** The mean total Positive Mental Health Scale and the Quality of Nursing Work Life Survey scores were  $73.27 \pm 14.86$  and  $103.42 \pm 13.01$ , respectively. It was determined that the work environment, work conditions, and job perception positively affected positive mental health, whereas the increase in relations with executive nurses negatively affected positive mental health and the perception of quality of work life was related to both positive mental health and quality of work life.

**Discussion:** It was determined that nurses perceived their positive mental health at a level close to good and their quality of work life at a moderate level, and both positive mental health perception and quality of work life perception differed according to some variables (age, hospital type, employment type and perception of work life). In addition, it was determined that the perception of quality of work life differed according to having children, the clinic and the length of service in the clinic, and the perception of positive mental health differed according to the length of service. Practices aimed at improving the leadership and management skills of nurse managers can contribute to improving the quality of work life and mental well-being of nurses.

**Key Words:** Quality of Work Life, Positive Mental Health, Hospital, Nurses

## INTRODUCTION

The workplace is a key environment that affects the mental health and well-being of employees. Therefore, executives need to provide an environment that supports and sustains both general health and work productivity in order to protect and promote employees' positive mental health (1,2). Hospitals are known for being both fulfilling and stressful work environments (3). In addition, nurses working in hospitals frequently face challenging situations that cause stress in their jobs (4). Therefore, there is a need to improve nurses' mental health through individual and institutional

approaches (5). Individuals with positive mental health take steps to confront situations that they are uncomfortable with, aiming to reduce or eliminate their discomfort and learning new coping methods in the process (6). Quality of work life refers to an employee's subjective satisfaction with his/her working life based on personal feelings and perceptions (7). Furthermore, this concept includes improving working conditions by considering employees' physical, mental, psychological, and social needs as well as creating an environment in which employees feel that they contribute to the organization and can realize and develop their talents (8).

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Given that nurses spend a significant amount of time at work, which can affect their entire lives (9), work life and mental health are intertwined (10). While work experience, day shifts, and working at a state-owned institution positively affect nurses' positive mental health, exposure to workplace bullying (11,12), work stress (13), and low income levels (4) negatively affect it. Quality of work life, which plays an important role in nurse turnover, intention to leave work, organizational commitment, work motivation, work and life satisfaction (7, 14-16), positively and significantly affects nurses' psychological well-being, burnout, happiness, general health levels, and ethical sensitivity good (2,4,9,17-21). Studies examining the factors affecting the quality of work life reported that age, experience, working in a field requiring expertise, full-time employment, rotating shift patterns, being in a managerial position (18,21-23), adequate and fair remuneration, safe and healthy working conditions, career development opportunities, leader support (2,16), social support (10,15) and psychological support and psychological empowerment (2,20) positively affect quality of work life. On the contrary, heavy workload, lack of staff, night shifts, musculoskeletal diseases, lack of supervisor support, lack of promotion opportunities, unfair and unjust hospital policies that do not support nursing care, lack of night shift allowance (3), depressed mood, economic difficulties (4), inadequate and unfair pay, unfair promotion policies, poor management support, high job stress, job insecurity, and insufficient participation in decision-making processes (24) negatively affect the quality of work life. Given that the most important goal of nursing services is to provide better quality and more comprehensive nursing services to society (25), continuous research on what affects quality of work life and positive mental health, their connections, and their consequences in order to create and develop more productive work environments that can increase the well-being of nurses will contribute to the emergence of new insights in achieving this goal. This study was conducted to evaluate positive mental health and quality of work life levels of nurses working in hospitals in terms of personal and work-related factors and to examine the relationship between positive mental health and quality of work life.

### Research questions

1. What are the perceptions of nurses about the quality of their work lives?
2. How do the nurses evaluate their positive mental health levels?
3. How do nurses' personal and working life characteristics affect their perception of the quality of work life and positive mental health levels?
4. What is the relationship between nurses' perceptions of the quality of work life and positive mental health levels?

### METHODS

**Design:** This study is descriptive and correlational (26).

### Participants

This study was conducted with nurses working in a training and research hospital, a general state hospital, or a mental health and disease hospital in the Western Black Sea region of Turkey between September and December 2018. The study population consisted of 384 nurses working in these hospitals, and the sample consisted of 247 nurses who volunteered to participate in the study, were not on leave on the dates of the study, and completed the data collection forms.

### Data collection

Nurses working in the relevant hospitals were informed about the study, and those who volunteered to participate in the study were given data collection forms and asked to complete them. It took 15–20 minutes to complete the forms.

### Introductory Information Form

This form, which was created by the researchers in line with the literature, includes questions about

personal and working life such as age, gender, education level, work experience, and number of shifts that may affect mental health and the quality of work life.

*Positive Mental Health Scale (PMHS):* This scale, which was developed by Lluch (1999) to define the positive mental health structure and level of individuals and adapted into Turkish by Teke and Arabacı (2018), consists of 39 items and six factors (27). The first factor "personal satisfaction" explains satisfaction with personal life, self-esteem, and optimism about the future. The second factor "prosocial attitude" includes being active toward society, being supportive toward others, and accepting those with different social characteristics. The third factor "self-control" addresses concepts such as emotional control, frustration, anxiety, and stress tolerance. The fourth factor "autonomy" deals with the regulation of one's own behavior, self-reliance, and independence. The fifth factor "problem solving and self-actualization" includes elements such as decision-making skills, the ability to adapt to change, and an attitude toward personal development. The sixth factor "interpersonal relationship skills" includes interpersonal relationship skills, the ability to empathize, and the ability to establish and maintain close relationships. Each item of the four-point Likert-type scale is scored as "always or almost always = 1," "quite often = 2," "sometimes = 3," and "never or rarely = 4." The highest score that can be obtained from the scale is 156, and the lowest score is 39. A low score on the scale indicates positive mental health. It was reported that the Cronbach's alpha value of the total score and subscale scores of the scale was above 0.70. (27). In this study, the total Cronbach's alpha value of the scale was 0.92.

*Quality of Nursing Work Life Survey (QNWLS):* The Turkish validity and reliability study of the scale, which was developed by Brooks (2001) to measure the quality of nurses' work lives, were conducted by Şirin and Sökmen 2015 (28). The scale consists of 35 items and five subscales. These consist of "Work Environment," which defines the conflicts related to nurses' workplace; "Relationships with Managers," which defines the relations of nurses with their managers in the workplace; "Work Conditions," which is defined as the practice area

where nurses work and explains the effect of the workplace on nurses and patient systems; "Job Perception," which defines nurses' thoughts about their workplace; and "Support Services," which defines the support services that nurses receive help from related to their workplace. The scale is a 5-point Likert-type scale (1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree). An increase in the total score that can be obtained from the scale indicates that the quality of work life of nurses is high. The Cronbach's alpha value of the scale was 0.89, and the Cronbach's alpha values of the subscales were between 0.62–0.81 (28). In this study, the total Cronbach's alpha value of the scale was 0.81.

### Data analysis

Statistical analyses were performed using the SPSS (IBM SPSS Statistics 24) software package. Frequency tables and descriptive statistics were used to interpret the findings. For non-normally distributed data, the Kruskal–Wallis H test ( $\chi^2$ -table value) was used to compare the measurement values of three or more independent groups. For normally distributed data, independent sample-t test (t-table value) was used to compare the measurement values of two independent groups, whereas ANOVA test (F-table value) was used to compare the measurement values of three or more independent groups. In cases where at least one of them did not show a normal distribution, Spearman's rank correlation coefficient was used.

### Ethical consideration

The study was conducted in accordance with the principles of the Declaration of Helsinki and approved by the Human Research Ethics Committee in Social Sciences (No. 2018/173) of the university where the study was conducted. In addition, official permission was obtained from the institutions where the study was conducted, and informed consent was obtained from all nurses participating in the study. During the data collection process, no identifying information that would reveal the identities of the nurses was requested.

The study has some limitations, such as the fact

**Table 1.** Distribution of findings related to scale scores

	Scale	Mean	Standard deviation	Median	Min.	Max.
Positive Mental Health Scale	Personal satisfaction	13,89	3,79	13,0	8,0	29,0
	Prosocial attitude	8,73	2,50	8,0	5,0	16,0
	Self-control	10,40	2,69	10,0	5,0	17,0
	Autonomy	8,89	2,47	9,0	5,0	19,0
	Problem solving and self-actualization	17,26	4,92	17,0	9,0	36,0
	Interpersonal relationship skills	14,09	2,93	14,0	7,0	21,0
	Total	73,27	14,86	72,0	39,0	104,0
Quality of Nursing Work Life Survey	Work environment	29,62	4,97	30,0	14,0	43,0
	Relationships with managers	9,29	2,32	9,0	5,0	16,0
	Work conditions	30,96	3,74	31,0	18,0	42,0
	Job perception	21,89	5,01	22,0	9,0	35,0
	Support services	11,67	3,11	11,0	4,0	20,0
	Total	103,42	13,01	103,0	64,0	136,0

that it was conducted in hospitals only in one province and that the data were obtained only with self-report scales.

## RESULTS

### Characteristics of participants

It was determined that 38.1% of the nurses who participated in the study were in the 24–29 age group, 83.4% were female, 56.3% were married, and 53.4% had no children. It was determined that 73.3% of the nurses had a bachelor's degree, 36.4% had been working for 5 years or less, 65.6% had been working in the unit for 3 years or less, and 23.1% worked in the surgical units. In addition, 47.8% of the nurses had eight or more shifts per month, and 51% of them considered the quality of work life to be at a moderate level.

### Results related to scales

The mean total score of the PMHS was  $73.27 \pm 14.86$ , the mean personal satisfaction subscale score was  $13.89 \pm 3.79$ , the mean prosocial attitude subscale score was  $8.73 \pm 2.50$ , the mean self-control subscale score was  $10.40 \pm 2.69$ , the mean autonomy subscale score was  $8.89 \pm 2.47$ , the mean problem-solving subscale score was  $17.26 \pm 4.92$ , and the mean interpersonal relations subscale score was  $14.09 \pm 2.93$  (Table 1).

The mean total score of the QNWLS was  $103.42 \pm 13.01$ , the mean work environment subscale score was  $29.62 \pm 4.97$ , the mean relationships with managers subscale score was  $9.29 \pm 2.32$ , the mean work conditions subscale score was  $30.96 \pm 3.74$ , the

mean job perception subscale score was  $21.89 \pm 5.01$ , and the mean support services subscale score was  $11.67 \pm 3.11$  (Table 1).

### Comparison of PMHS and QNWLS scores of nurses according to their personal and work life characteristics

A statistically significant difference was found in terms of total PMHS scores according to the age groups of nurses ( $F=2,755$ ;  $p=0.029$ ), years of service (years) ( $F=6,264$ ;  $p=0.002$ ), the hospital they worked in ( $F=7,614$ ;  $p=0.001$ ), staff status ( $t=-2.035$ ;  $p=0.043$ ), and their perception of work life ( $F=4.969$ ;  $p=0.008$ ) (Table 2).

No statistically significant difference was found in terms of gender, marital status, educational level, having children, length of service in the unit, unit of employment, number of shifts, in total PMHS scores ( $p>0.05$ ) (Table 2).

A statistically significant difference was found in terms of total QNWLS scores according to the age groups of nurses ( $F=3.052$ ;  $p=0.018$ ), number of children ( $t=-2,008$ ;  $p=0.046$ ), years of working in the unit (years) ( $t=-3,047$ ;  $p=0.003$ ), units they worked in ( $\chi^2=21,027$ ;  $p=0.001$ ), hospital they worked in ( $\chi^2=8.890$ ;  $p=0.012$ ), staff status ( $t=-2.055$ ;  $p=0.041$ ), and perception of work life ( $\chi^2=32.710$ ;  $p=0.001$ ) (Table 2).

No statistically significant difference was found in terms of gender, educational level, marital status, number of seizures, total years of employment, in total QNWLS scores ( $p>0.05$ ) (Table 2).

**Table 2.** Comparison of the total scores of QNWLS and PMHS according to personal and work characteristics

Variable (N=247)		n	QNWLS total		PMHS total	
			Median [Min-Max]	Probability Difference	Median [Min-Max]	Probability Difference
Age	18-23 <sup>(1)</sup>	23	100,39–15,50	F=3,052 <sup>b</sup> p=0,018 [2-4]	67,43–14,51	F=2,755 <sup>b</sup> p=0,029 [1-3]
	24-29 <sup>(2)</sup>	94	101,43–12,94		74,02–14,78	
	30-35 <sup>(3)</sup>	55	102,71–09,63		77,69–15,63	
	36-41 <sup>(4)</sup>	52	108,50–13,61		71,27–14,66	
	42/∞ <sup>(5)</sup>	23	104,83–14,07		70,00–11,34	
Education level	Below undergraduate	53	103,74–13,26	t=0,198 <sup>c</sup> p=0,843	70,45–14,06	t=-1,563 <sup>c</sup> p=0,119
	Undergraduate and higher	194	103,34–12,98		74,04–15,01	
Having children	No	132	101,88–13,42	t=-2,008 <sup>c</sup> p=0,046	73,23–15,32	t=-0,041 <sup>c</sup> p=0,967
	Yes	115	105,19–12,34		74,31–14,37	
Years of service (years)	5/v <sup>(1)</sup>	90	102,22–12,74	F=2,661 <sup>b</sup> p=0,072	72,07–14,39	F=6,264 <sup>b</sup> p=0,002 [2-1,3]
	6-10 <sup>(2)</sup>	67	101,69–12,84		78,54–15,17	
	11 and above <sup>(3)</sup>	90	105,91–13,17		70,56–14,23	
Working hospital	Training and Research Hospitals <sup>(1)</sup>	140	101,0 [64,0-136,0]	x <sup>2</sup> =8,890 <sup>a</sup> p=0,012 [1-3]	76,31–15,86	F=7,614 <sup>b</sup> p=0,001 [1-2]
	Public Hospital <sup>(2)</sup>	79	105,0 [66,0-135,0]		68,48–12,46	
	Mental Health and Diseases Hospital <sup>(3)</sup>	28	112,0 [76,0-136,0]		71,57–12,25	
Staff status	On-Contract	66	100,62–12,87	t=-2,055 <sup>c</sup> p=0,041	70,11–12,84	t=-2,035 <sup>c</sup> p=0,043
	Permanent	181	104,44–12,95		74,43–15,40	
Units	Internal	55	103,0 [64,0-122,0]	x <sup>2</sup> =21,027 <sup>a</sup> p=0,001 [3-1,2]	74,27–15,40	F=2,000 <sup>b</sup> p=0,095
	Medicine <sup>(1)</sup>	57	100,0 [75,0-135,0]		72,31–14,43	
	Surgical <sup>(2)</sup>	28	100,0 [75,0-135,0]		71,93–11,98	
	Psychiatry <sup>(3)</sup>	51	113,0 [81,0-136,0]		77,63–16,98	
	Intensive Care <sup>(4)</sup>	56	104,0 [82,0-128,0]		69,96–13,36	
	Other <sup>(5)</sup>		104,5 [66,0-136,0]			
Years of working in the unit (years)	3/v	162	101,62–13,12	t=-3,047 <sup>c</sup> p=0,003	72,99–13,98	t=-0,393 <sup>c</sup> p=0,695
	4 and above	85	106,85–12,15		73,81–16,48	
Perception of work life	Poor <sup>(1)</sup>	80	97,0 [64,0-135,0]	x <sup>2</sup> =32,710 <sup>a</sup> p=0,001 [1-2,3] [2-3]	74,81–15,42	F=4,969 <sup>b</sup> p=0,008 [3-1,2]
	Moderate <sup>(2)</sup>	126	104,0 [73,0-136,0]		74,43–14,55	
	Good <sup>(3)</sup>	41	110,0 [66,0-136,0]		66,71–13,18	

<sup>a</sup> Kruskal-Wallis H test, <sup>b</sup> ANOVA test, <sup>c</sup> Independent Sample-t test,

### Examination of the relationships between scale scores

There was a weak relationship between the total PMHS score and the QNWLS work environment score ( $r = -0.346$ ;  $p = 0.000$ ); a very weak and negative relationship between the work conditions ( $r = -0.156$ ;  $p = 0.014$ ) and work perception scores ( $r = -0.144$ ;  $p = 0.024$ ); and statistically significant, moderate, and positive relationship between the scores of relations with executive nurses ( $r = 0.731$ ;  $p = 0.000$ ) (Table 3).

### DISCUSSION

According to the study's findings, nurses perceived

their positive mental health to be near-good and their quality of work life to be moderate. In the literature, similar to the results of this study, there have been studies that show nurses rate their positive mental health as good (1,12,17,29) as well as studies that show nurses do not rate their positive mental health as good (30). Various outcomes have been observed in studies on the quality of work life. It was found that nurses rated their quality of work life at a low level (31,32), at a moderate level (9,21,33-36) and at a good level (18,36). These findings indicate that positive mental health and quality of work life are influenced by many factors, that the lack of a certain standard yields different outcomes, and that differences between countries might have an effect on these results. Given that the quality of work life varies even among clinics

**Table 3.** Examination of the relationship between the scale scores

Correlation *		Quality of Nursing Work Life Survey						
			Work environment	Relationships with managers	Work conditions	Job perception	Support services	Total
Positive Mental Health Scale	Personal satisfaction	r	-0,305	0,679	-0,075	-0,126	-0,029	-0,072
		p	0,000	0,000	0,238	0,047	0,650	0,262
	Prosocial attitude	r	-0,157	0,448	-0,136	-0,003	0,053	-0,012
		p	0,014	0,000	0,032	0,964	0,409	0,846
	Self-control	r	-0,259	0,514	-0,088	-0,141	-0,029	-0,080
		p	0,000	0,000	0,167	0,026	0,652	0,209
	Autonomy	r	-0,281	0,731	-0,105	-0,102	0,013	-0,033
		p	0,000	0,000	0,100	0,109	0,842	0,602
	Problem solving and self-actualization	r	-0,263	0,478	-0,122	-0,072	0,013	-0,065
		p	0,000	0,000	0,055	0,262	0,845	0,312
Interpersonal relationship skills	r	-0,277	0,588	-0,149	-0,149	-0,010	-0,100	
	p	0,000	0,000	0,019	0,019	0,876	0,118	
Total	r	-0,346	0,731	-0,156	-0,144	-0,011	-0,101	
	p	0,000	0,000	0,014	0,024	0,866	0,113	

\*Spearman

within the same institution, it is normal to detect disparities between institutions or countries. Positive mental health, which affects the quality of work life, is not an inexhaustible resource, and negativity at work is a factor that can deplete this resource. According to the results obtained from the comparison of positive mental health with personal and work life variables, it was determined that age, years of service, type of hospital worked in, staff status, and subjective opinion about work life affected the evaluation of positive mental health, whereas gender, marital status, educational level, having children, length of service in the unit, unit of employment, number of shifts did not affect the evaluation.

Although there was no significant difference between positive mental health scores according to educational level, it was found that those have below undergraduate degree had better positive mental health perceptions. In a study conducted with nurses in Poland, it was determined that higher education was a factor that positively affected mental health self-assessment in nurses compared to secondary education and that nurses with higher education tolerated unpleasant work conditions better (38). In a study conducted with nurses in China, it was reported that nurses with a higher level of education experienced less emotional exhaustion, which was attributed to an increase in the perception of personal achievement and higher income due to the assignment of nurses with a higher level of education to more challenging tasks (39). Considering this information, the finding regarding the level of education in our study may be related to the fact that the level of education and

professional expertise are not yet fully taken into account in the criteria for assignment and remuneration of nurses in Turkey.

In our study, it was found that the positive mental health of the employees working in a state hospital was at a better level than the employees working in a training and research hospital. Similar to this result, a study conducted in Jordan found that nurses working in public hospitals had better positive mental health than those working in private hospitals (12). In a study conducted in a training and research hospital in Turkey, it was determined that more than half of the nurses were in a risky group in terms of mental health and that mental health problems decreased as nurses' positive perceptions of work environment increased (40).

This result may be related to the characteristics of training and research hospitals. Training and research hospitals in Turkey are high-level tertiary hospitals where advanced examinations and specialized treatments are performed, high-level technology is used, and training and research services are provided. Owing to these characteristics, although nurses working in these hospitals meet more complex care demands, the fact that nurses' salaries are not regulated accordingly may have negatively affected their positive mental health.

In our study, it was found that both quality of work life and positive mental health increased significantly as the subjective perception of quality of work life improved from poor to moderate and from moderate to good. Tamer and Öztürk (2021)



reported that nurses who evaluated their quality of work life as poor had lower quality of work life scores (21). In a study conducted with 434 intensive care nurses in China, it was concluded that the better the nursing work environment, the better the quality of work life (41). These results suggest that nurses' subjective perception of quality of work life (poor, moderate, and good) is an indicator of both positive mental health and quality of work life. Even a small assessment question such as "How do you rate the quality of your work life?" can give managers an idea about employees and the work environment.

In the literature, similar to our study, it was found that variables such as gender (42), work experience, marital status, having children, and the health institution worked at (4,12) did not have a significant effect on positive mental health. Contrary to our study, there are studies showing that gender (43) and shift work status (12) have a significant effect on positive mental health. These different results may be due to differences in personal perception.

When the results obtained from the comparison of quality of work life with personal and work life variables were examined in our study, it was determined that age, having children, type of hospital, years of service in the current department, department of employment, type of employment, and subjective perception of work life affected the quality of work life, while education level and total years of employment did not.

We found that the quality of work life in the 36–41 age group was significantly higher than in the 24–29 age group. In some studies conducted with nurses, it was determined that their quality of work life increased as their age increased and that the work experience that comes with age, a stable work life, and developing a more positive attitude toward situations or events in the work environment may have an effect on this result (23,24,33). On the contrary, there are also studies that found that the quality of work life of nurses aged  $\leq 20$  years is higher than other age groups (32), that the quality of work life decreases with age due to a decrease in physical and cognitive levels (4,35,37,44), and that there is no significant relationship between age and

quality of work life (3,22,45). According to studies, the variability of the relationship between age and quality of work life is thought to vary depending on the benefits of increasing age.

In terms of the status of having children, it was found that the quality of work life of those with children was significantly higher than that of those without children. However, there are also studies showing that there is no relationship between having children and the quality of work life (23, 32).

In our study, it was determined that the quality of work life of employees working in the mental health hospital was significantly higher than that of those working in the training and research hospital. In addition, it was found that the quality of work life of nurses working in psychiatric clinics was significantly higher than that of those working in internal medicine and surgical units. These results coincide with the fact that the positive mental health of nurses working in training and research hospitals is lower than that of those working in public hospitals. In studies conducted in different countries in the literature, it was determined that the quality of work life of nurses working in tertiary hospitals was lower than that of those working in secondary hospitals (24, 35) and the quality of work life of nurses working in specialty hospitals such as otolaryngology and psychiatric care was higher than that of nurses working in general hospitals (22). In the studies conducted in the units where nurses work, it was reported that nurses working in intensive care units and emergency departments had a better quality of work life than nurses working in other clinics (21) and those working in surgical diseases clinics and intensive care units had a better quality of work life than those working in internal medicine clinics (18). In addition, it was determined that the quality of work life of nurses working in the emergency department who were trained in this field was higher than that of those who did not receive training specific to this field (34). The reason why the quality of work life varies even in different clinics within the same institution may be due to the lack of standardization of conditions such as workload and work environment. Furthermore, these results suggest that specialization, which is a result of working in specific units, positively affects the quality of work life. In this

respect, hospitals encouraging nurses to specialize and employing them in units appropriate to their areas of specialization can improve the quality of work life.

In our study, although not statistically significant, it was found that the quality of working life of nurses with a total working time of 11 years or more was significantly higher than that of nurses who worked less than 11 years. Similar to our study, although there are studies in the literature showing that work experience increases quality of work life (3,22,23,32) reported that the quality of work life scores of nurses who worked for less than 1 year were higher (32). Although the quality of work life is normally expected to increase with years of employment, this may be affected by different variables, such as the hospital and clinic or work conditions, leading to different results.

In our study, it was determined that the quality of work life of permanent employees was significantly higher than that of contract employees. In some studies in the literature, it has been determined that permanent nurses have a higher quality of work life than contract nurses and temporarily employed nurses; this is associated with higher income, better career prospects, and job stability (22,46). Contrary to our study's findings, Güçlü and Kurşun (2018) reported that contract nurses had a higher quality of work life than permanent nurses; this was associated with the fact that contract nurses were younger (32). The result regarding the type of employment in our study is thought to be due to the fact that permanent nurses have more advantages financially, legally, and in terms of work conditions.

In our study, no significant relationship was found between gender, marital status, type of work, number of shifts, receiving training, educational level, total years of employment, and quality of work life. In the studies in the literature, it was found that there was no significant difference between variables such as age, gender, marital status, education level, number of children, income level, type of work, the number of monthly shifts (21,34), participation in a certificate program related to personal development, working overtime and quality of

work life. However, unlike our study results, there are opposite results in the literature, such as the fact that the quality of work life of nurses with post-graduate education level is higher than others (47) and the quality of work life scores of nurses graduated from medical vocational high school are higher than those with an associate or undergraduate degree (32). In a study conducted by Lebni et al. 2021 (46) with nurses in Iran, it was found that the quality of work life of those with high work experience and education level, those working in intensive care, those working in evening and night shifts had high quality of work life, while the quality of work life of those over 50 years of age, single and temporary workers was lower than the other groups. In addition, it was found that the quality of work life scores of nurses in managerial positions who did not work shifts (18) and male and married nurses were higher (32). In a study conducted by Van et al. (2020) with nurses, it was found that education level (university) was most strongly associated with quality of work life (36). These results show that there is no definite view about the variables affecting quality of work life and that there are many variables that can affect quality of work life.

According to another result in our study, as the work environment, work conditions, and job perception scores increase, which are subscales of the quality of work life, the positive mental health scores decrease. In other words, the positive mental health of employees is positively affected. Considering the fact that the work environment, work conditions, and job perception subscales cover a wide range of topics such as the positive approach of senior management of the institution, satisfaction with teamwork, workload not disrupting the work-family life balance, and a positive social and institutional perspective on nursing, this is an expected result. It was determined that there was no significant relationship between the support services subscale, which defines the support services that nurses receive relevant to their field of work, and positive mental health. On the contrary, as the score of the relationships with managers subscale increases, which includes being able to communicate with executive nurses, providing adequate supervision and control, receiving feedback on performance, participating in decisions, and

being appreciated, the positive mental health score also increases, implying that the employees' positive mental health suffers. According to studies in the literature, not being supported by executive nurses is an obstacle to nurses' quality of work life (3) and being valued and recognized by superiors positively affects the mental health of nurses (48). Ni et al. 2023 found that career development, leadership and management, professional autonomy and manpower competence had significant effects on nurses' quality of work life. In line with these results, it was suggested that nurse managers should strengthen the structure of the nurse team, pay attention to person-task matching, and increase nurses' work autonomy and sense of empowerment (41). In the study of Cosentino et al. 2023, it was determined that the behaviours of manager nurses in the leader position such as being interested in team welfare, taking time to discuss team concerns, working closely with the team, allowing flexibility in working hours and shift planning, getting to know team members, listening with real interest and offering career advancement opportunities had a positive effect on the quality of work life of nurses (49). While it was expected that a good relationship between nurses and executive nurses would positively affect the mental health of employees, the opposite result was obtained in our study. There is a need to investigate whether this situation is related to reasons such as the adequacy of the managerial and leadership skills of executive nurses and the equivalence of their authority and responsibilities. Nursing care is a complicated job that demands nurses to be in good physical and psychological condition (4). Nurses, the largest group of healthcare providers, should have a satisfactory quality of work life in order to provide quality care to their patients (22). Because quality of work life and positive mental health affect both nurses and the individuals they care for, additional research is needed to address these two concepts.

Nurses' quality of work life and mental well-being have the potential to directly affect the quality of nursing services and patient outcomes. Therefore, investigating what affects the quality of work life and positive mental health will contribute to the emergence of new understandings in order to develop more efficient working environments that will increase the well-being of nurses. The most

striking results of our study are that interacting with nurse managers negatively affects the positive mental health of nurses, and being specialized in a field positively affects the positive mental health of nurses. Hospital managers should take into account nurses' self-assessments of their quality of work life, implement practices to strengthen relations with executive nurses, and create work conditions that will enable nurses to specialize in a field. Practices aimed at improving the leadership and management skills of nurse managers can contribute to improving the quality of work life and mental well-being of nurses. In addition, implementing practices such as providing in-service trainings to improve nurses' mental health literacy levels and providing mental health support to nurses from time to time may have positive effects on both positive mental health and quality of work life of nurses.

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# An interesting complication of COVID-19: Partial avulsion of the auricle due to face-mask use in a psychotic patient

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## SUMMARY

COVID-19, which develops as a result of SARS-CoV-2 infection, was declared a global pandemic by the World Health Organization shortly after its discovery in Mainland China. Social distancing, hygiene and the use of personal protective equipment have been strongly recommended worldwide as COVID-19 spreads through droplets. In Turkey, a mandate was issued on September 8, 2020, requiring individuals to wear face masks in all areas other than their own residences and stating that those who do not comply with the mandate will be subject to various criminal sanctions. In various parts of the world, such practices have aimed to popularize the use of face masks, but detailed information about individuals with special conditions such as children, the elderly, psychiatric patients, and patients with neurodegenerative diseases has not been sufficiently included. We believe that people with psychiatric illness have a special place in this group due to the nature of mental illness. Perceptual impairments in patients with schizophrenia may lead to exaggerated application of recommended precautions. This has raised the issue of whether personal protective equipment may cause undesirable effects as a result of prolonged exposure in these individuals. In this case report, we present a partial auricle avulsion in a patient with schizophrenia who used his mask for a long time without removing it because he was afraid of mandatory face mask use. Our case is one of the few psychiatric cases in the literature in which auricular avulsion due to prolonged face mask use is seen.

**Keywords:** COVID-19, pandemic, face mask, schizophrenia, auricular avulsion

## INTRODUCTION

COVID-19, which develops due to SARS-CoV-2 infection, was declared a global pandemic by the World Health Organization shortly after its discovery in Mainland China (1, 2). Because COVID-19 spreads through droplets, social distancing, hygiene and personal protective equipment use have been strongly recommended both in Turkey and other countries of the world. In Turkey, a mandate that required every person to wear facemasks in all spaces except one's own residence was published by the government on 8 September 2020, and to ensure compliance, it was stated that various criminal sanctions would be issued against those who would not abide by the mandate (3, 4). In different parts of the world, it has been aimed to make the use of facemasks prevalent with such recommendations, practices and mandates. Still, it has been seen

that detailed information has not been included adequately about individuals who have special conditions such as children, the elderly, psychiatric patients, patients with neurodegenerative diseases and those with chronic respiratory distress. We believe that people with psychiatric illness have a special place in this group due to the nature of the mental illness. There are various studies in the literature on the adherence of patients with schizophrenia to COVID-19 precautions (5). Perceptual disorders in patients with schizophrenia may lead to the exaggerated application of the recommended measures, too. This has raised the issue of whether personal protective equipment may cause undesirable effects due to prolonged exposure in these individuals. This case report presents the case of partial avulsion of the auricle observed in a patient with schizophrenia who used facemasks for protracted durations without taking

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**Picture 1:** Avulsion extending up to the crus of the helix of the auricle, and the epithelialized wound edges. **Picture 2:** De-epithelialized wound edges before suturing. **Picture 3:** Sutured view of the avulsion.

them off due to his fear of enforcement of the compulsory facemask policy. Our case is one of the few psychiatric cases in the literature in which auricular avulsion due to prolonged face mask use is seen.

## CASE REPORT

The 32-year-old male patient, who applied to the otorhinolaryngology outpatient clinic with the complaint of partial avulsion on the upper part of his left auricle, was referred to the psychiatry outpatient clinic after a physical examination, because he had schizophrenia. In the patient's history, it was learned that he had been wearing the facemask that he used for protection against COVID-19 constantly for a duration of longer than three months. He stated that he was worried about the sanctions he could face if he did not wear a facemask, and due to this concern, he had not taken off his facemask even when sleeping. In the anamnesis obtained from his family, it was found out that he had been receiving treatment with olanzapine 10 mg/day and paliperidone 100 mg/month. He had been living in the streets separately from his family for approximately three months, and thus, his family had not been able to control him.

On psychiatric examination, consciousness was clear and orientation to person, place and time was intact. His general appearance was age-appropriate with decreased self-care. There were unused face masks in his jacket pocket. Despite the avulsion on the auricle, he was still wearing a facemask on his ears. He occasionally made eye contact. He tended to watch and examine the objects in the outpatient

clinic room. His emotional expression was limited. He had spontaneous speech and responded adequately and purposefully to the questions asked. He had delusions that the state was monitoring and controlling him through hidden cameras at home and security forces outside. He reported that he took care to wear his mask at all times to avoid punishment and being infected. He had auditory hallucinations of human voices commenting on the measures he had taken, sometimes accusing him. His ability to assess reality was impaired and his insight into his illness was diminished. He reported no use of alcohol or psychoactive substances. On physical examination the avulsion on the ear of the patient extended up to the crus of the helix of the auricle, and the wound edges were epithelialized (Picture 1).

As a result of the history obtained from the patient and his family, clinical interviews and evaluations, it was thought that the patient had a diagnosis of schizophrenia and was in the exacerbation period and his medical treatment was organized. The patient was offered hospitalization in the psychiatry inpatient clinic, but the patient and his relatives refused. Thereupon, his treatment was planned to be carried out with close outpatient follow-up. It was learned that the patient was receiving paliperidone palmitate 100 mg/month and olanzapine 10 mg/day, and according to the information obtained from medical records and anamnesis, the last depot injection was administered one month ago. The new monthly paliperidone palmitate dose was administered immediately, and oral treatment was arranged as olanzapine 20 mg/day and alprazolam



2\*0.5 mg/day. The patient was referred to the otorhinolaryngology outpatient clinic and informed that the avulsed auricle needed to be sutured across. After the patient and his family agreed to the intervention, the epithelialized wound edges were de-epithelialized under sterile conditions and local anesthesia (Picture 2). The avulsion was sutured using 4/0 absorbable suture material and a satisfactory result was obtained (Picture 3). Prophylactic oral antibiotic treatment was started. The patient was provided with a simple neck protector and was ensured to wear the face mask on the neck protector without touching the ears.

## DISCUSSION

In the literature, various studies have been conducted to evaluate the compliance of psychiatric patients with protective measures during pandemic periods. In most studies, preventive behaviours were associated with fear of infection (6,7). In the study by Jung et al. examining the factors related to mask use among inpatient psychiatric patients during the COVID-19 pandemic, wearing a mask was found to be significantly associated with voluntary admission, having a diagnosis of psychosis and being hospitalized in a public hospital (6). In a study conducted during the pandemic swine flu, in people with schizophrenia, higher levels of predicted fear were associated with increased likelihood of perceived substantive risk from swine influenza and self-reported willingness to adopt protective measures against it (7). During pandemic periods, individuals in vulnerable populations such as psychiatric patients should be carefully monitored for compliance with protective measures. This case report is important to show the impact of COVID-19 on vulnerable populations, including those with psychiatric illnesses such as schizophrenia, where perception disorders are common. Our patient who was suffering from schizophrenia kept wearing his facemask constantly due to the delusion that he could be under monitoring and fear of getting infected, and he experienced auricular trauma. This case is also one of the few cases in the literature regarding trauma to the auricle due to prolonged and uncontrolled use of face masks.

Mask-induced ear injuries are usually due to the development of pressure ulcers, and the anatomy of the auricular region makes the ear vulnerable to

such injuries (8). Recommendations for prevention include regular inspection of the skin/ear conditions, self-check of mask tension, ear injury education and using masks only when necessary (9). In the literature, a case of ear injury due to prolonged mask use in a patient with schizophrenia who was still being treated in the hospital has been reported. The healthcare staff recognised the injury and intervened in the early period (10). In another case, a schizophrenia patient in a long-term care facility was reported with a partial transection from the concha to the helical rim due to prolonged mask use, similar to our case (11). In our case, the ear injury worsened because the patient was in the exacerbation period and had left home and lived separately from his family. Poor hygiene conditions and high pain threshold in schizophrenia may have contributed to this result (10). Although studies are reporting good compliance with precautions in patients with schizophrenia (5), in some studies, it has been suggested that cognitive impairment reduces the perception of the necessity of self-protection and awareness of COVID-19 in schizophrenia. These reasons increase the risk of COVID-19 positivity in a patient with schizophrenia (12), and it has been reported that a patient with schizophrenia have difficulty in complying with preventive regulations (13). Contrary to previous information in the literature, it is noteworthy that our case had COVID-19-related delusions and hallucinations, excessive compliance with COVID-19 precautions, and as a result, partial avulsion of the auricle.

In conclusion, our case is important as it demonstrates the rare consequences of the COVID-19 pandemic in psychiatric patients. We believe that in extraordinary situations such as a pandemic, psychiatric patients in vulnerable populations are of particular importance and should be monitored more closely.

Note: Permission for publication and use of photographs has been obtained from the patient's relative.

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# Evaluation of services for combating addiction in Turkey within the scope of the twelfth development plan (2024-2028)

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Dear Editor,

Within the scope of the struggle against drug addiction, which has increasingly become a major problem all over the world, important decisions have been taken and various regulations have been introduced in our country, especially in the last 20 years.

In 2004, the Regulation on Substance Addiction Treatment Centers(1) entered into force in our country and in the same year, the decision to join the European Union Monitoring Center for Drugs and Drug Addiction (EMCDDA) was taken and the accession agreement was signed in Ankara on August 26, 2004 and signed on October 30, 2007(2). Following these arrangements, in 2006, within the framework of our national needs and our obligations in the process of candidacy to the European Union, the “National Policy and Strategy Document for Combating Addictive Substances and Addiction” covering the years 2006-2012 came into force and the first “National Drug Action Plan” (2007-2009) was put into practice in our country(2).

In 2014, envisioning the necessity to initiate a multi-stakeholder fight against drugs, the High Council for Combating Drugs was established with the Prime Ministry Circular (3), the Emergency Action Plan and Strategy Document for Combating Drugs (4) came into force in 2015, and the National Action Plan and Strategy Document for Combating Drugs came into force in 2016-2018 (5). The neces-

sity of including a training module on substance addiction and AMATEM/ÇEMATEM rotation in the curriculum of specialty training of psychiatrists and child and adolescent psychiatrists was mentioned for the first time in the Emergency Action Plan and Strategy Document on Combating Drugs published in 2015, and in the same action plan, it was aimed to have at least 5 outpatient treatment centers operational by the end of 2015(4). In the 2016-2018 National Action Plan, it was planned to make it compulsory to open inpatient AMATEM/ÇEMATEM in the adult and child-adolescent mental health diseases training clinics planned to be opened within the Training and Research Hospitals(5).

In 2017, a Prime Ministry Circular expanded the mandate of the High Council for Combating Drugs and established the High Council for Combating Addiction under the chairmanship of the Deputy Prime Minister with the participation of 11 ministers (6). Subsequently, in 2019, with the Presidential Circular, the High Council for Combating Addiction was reconstituted with the participation of 11 ministers under the chairmanship of the Vice President and the Deputy Chairman of the Presidential Health and Food Policies Board (7).

When the processes related to addictions are examined within the framework of development plans in our country; it is understood that the Second Development Plan (1968-1972) first drew attention to the issue with the statement “There is no activity on the social rehabilitation of alcoholics and toxico-

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maniacs, and the issue is dealt with to a limited extent in terms of purity and safety measures” (8). In the following period, in the Third Development Plan (1973-1977), “A center will be established to conduct research on the abuse of drugs, alcoholism and drug addiction” (9), and in the Fifth and Sixth Development Plans (1990-1994), “Measures to protect and deter young people from smoking, alcohol, drugs, gambling and similar habits, as well as measures to eliminate the elements that create environments for crime will be handled in integrity.” (10,11).

In the Eighth Development Plan (2001-2005), the necessity to make legal and theoretical arrangements was stated for the first time as “Sub- and upper Boards for Monitoring and Directing the Fight against Drug Use will be given a legal status as monitoring, supervision and coordination units and their effective functioning will be ensured.” (12). On the other hand, in the Ninth Development Plan (2007-2013), it was emphasized that although some progress was made in the fight against drug use and addiction in our country, it lagged behind the targets of the previous plan (13). In the Tenth Development Plan prepared for 2014-2018, it was stated that harmful habits such as smoking, alcohol and drugs and internet addiction continue to be important risk factors for children and young people, and the goal of activating controls by organizing programs and campaigns was put forward (14).

In our country, the most comprehensive changes regarding preventive services and treatments in the fight against addiction have started to be implemented with the regulations made within the scope of the National Strategy Document and Action Plan for Combating Drugs 2018-2023 and the 11th Development Plan (2019-2023) (15). In this period, a paradigm shift was made by repealing the Regulation on Substance Addiction Treatment Centers in 2019 and replacing it with the Regulation on Addiction Counseling, Detoxification and Rehabilitation Centers. In this context, the Rehabilitation Model for Addicted Patients (BAHAR) was established in order to facilitate the adaptation of individuals to social life without using drugs again by keeping them in contact with treatment institutions after addiction treatment and it was planned to be disseminated

throughout the country (15). Also during this period, the “2019-2023 National Strategy Document and Action Plan for Combating Behavioral Addictions” was prepared and put into practice (16).

In the recently enacted Twelfth Development Plan (2024-2028), it was emphasized that the fight against drugs will continue with a multidimensional and holistic approach (17). In this context, it is planned to take various security measures against the supply of drugs and to continue to work on informing and raising awareness of families, children and young people about the fight against addiction. In addition, it was aimed to increase the number of Child Adolescent Substance Addiction Treatment and Training Centers (ÇEMATEM) in our country and the number of qualified personnel employed in these centers, to establish evidence-based practices within the scope of combating behavioral addictions, to conduct periodic research on the frequency of substance use in our country and to share the results of these researches between institutions by observing data privacy (17).

As stated in the development plans made in various periods in our country, detoxification centers have been opened in the past years due to the increasing needs in the treatment of substance addiction and these centers have been expanded throughout the country. As of January 2024, there are a total of 115 detoxification centers in our country, 70 of which are outpatient and 45 of which are inpatient (18). On the other hand, only 12 of these centers serve as ÇEMATEM (18). When the number of BAHAR centers in our country is reviewed, rehabilitation services are currently provided in a total of 16 BAHAR centers, 4 of which are inpatient, 10 of which are outpatient for adult patients and 2 of which are outpatient for child-adolescent patients (19).

To summarize, the efforts to combat addiction in our country have progressed especially after 2014, primarily by increasing the number of treatment centers and reviewing their qualifications, and then gained a different momentum with a holistic perspective. However, the number of ÇEMATEM and rehabilitation centers in our country is still not suf-

ficient. In addition, the fact that there are still no closed AMATEM clinics in many provinces, including our detoxification center, where compulsory treatment decisions can be implemented, causes delays in the treatment of patients and poses various social risks.

As emphasized in the Twelfth Development Plan, it is necessary to increase the number of AMATEMs and centers where compulsory treatment decisions

for substance addiction are implemented and to integrate these centers with BAHAR rehabilitation centers.

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