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Contents

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Is there a miracle for dementia following bipolar disorder? Lithium and its neuroprotective effects

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The articles on lithium and Alzheimer's disease (AD) published in the August and September 2025 issues of Nature have generated significant attention in the neuroscience community. AD is the most common neurodegenerative pathology worldwide, leading to profound impairment in quality of life, health, and functioning, while reducing life expectancy, imposing a substantial economic and caregiving burden. Its multifactorial etiopathogenesis involves protein aggregation, mitochondrial dysfunction, oxidative stress, and neuroinflammation, all of which disrupt multiple cellular pathways, with effective treatment strategies still elusive. This makes the recent lithium–AD studies particularly noteworthy.

In these studies, spectrometric analyses revealed that among essential trace metals naturally present in brain tissue, only lithium was found to be significantly reduced in the prefrontal cortex of individuals diagnosed with Mild Cognitive Impairment (MCI) and AD compared to healthy controls (1). The same research group demonstrated in AD mouse models that dietary reduction of endogenous lithium by 50% accelerated cognitive decline through amyloid-β accumulation, tau hyperphosphorylation, pro-inflammatory microglial activation, and synaptic, axonal, and myelin loss. Interestingly, higher lithium concentrations were observed within amyloid plaques, suggesting that AD pathology may sequester lithium in affected regions, leading to depletion in other areas and thereby promoting disease progression. This raises the provocative question: Is AD, in part, a disorder of lithium deficiency? A disturbance in lithium homeostasis might contribute to the acceleration of pathology.

Some of lithium's restorative effects are mediated through inhibition of glycogen synthase kinase-3β (GSK3β) activity. Other proposed mechanisms include enhancing neuronal glucose uptake, promoting glycolysis to replenish ATP levels, upregulating the primary neuronal glucose transporter GLUT3, increasing glucose utilization in the hippocampus, and elevating glycolytic flux and the ATP:ADP ratio via AMP-activated protein kinase (AMPK) activation. Notably, mitochondrial dysfunction—long studied in bipolar disorder—has also been demonstrated in AD, suggesting another potential domain for lithium's therapeutic action.

In addition, lithium has been listed among candidate molecules (alongside rapamycin, mTORC1 inhibitors, metformin, clonidine, curcumin, nicotinamide, bexarotene, and trehalose) proposed to regulate autophagy, a pathway increasingly considered as a therapeutic target in AD.

According to the findings of Aron and colleagues, replacement therapy with lithium orotate in experimental mouse models reduced amyloid binding, prevented memory loss and pathological changes, and even reversed some neuropathological features. This critical outcome appears groundbreaking, as true reversal of pathology has not yet been achieved in dementia treatment.

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Lithium Orotate, Alzheimer's Disease, and Neuroprotection

Lithium orotate is a lithium salt with lower affinity for binding to amyloid plaques compared to lithium carbonate; paradoxically, it becomes more sequestered within plaques, thereby maintaining higher levels of lithium in brain tissue. Lithium orotate is administered at much lower doses than lithium carbonate and carries the additional advantage of minimizing metabolic side effects. However, as a relatively newer formulation, our knowledge regarding its pharmacokinetics, pharmacodynamics, toxicity thresholds, and therapeutic dose ranges in humans remains insufficient. Genetic and environmental factors may significantly influence lithium levels and could play an important role in explaining interindividual differences—an area warranting further investigation.

Among potential biomarkers for AD, brain lithium measurement holds promise for the future, though translational research is still required before it can be adopted in routine clinical practice. While there is currently no clinical trial evidence demonstrating the efficacy of lithium orotate in AD, it clearly represents an emerging and important field of investigation.

As with most neuropsychiatric disorders, reducing the AD–lithium relationship to one or two mechanisms is unlikely to capture the complexity of brain pathologies with intricate network interactions, especially given the role of gene–environment interactions in disease etiopathogenesis. The emerging discussion of metal homeostasis, including lithium, thus represents an important conceptual advance in AD research (2). Another intriguing finding regarding lithium orotate relates to amyloid plaques being negatively charged: these may attract and sequester positively charged lithium ions, thereby depleting intracellular lithium. Lithium orotate, by contrast, is not ionized, which enables it to bypass this "trap," restore neuronal function, and contribute to healthier, "younger" brain physiology with improved cognitive outcomes (3).

It is worth recalling the earlier studies—possibly an inspiration for the current research groups—that examined trace levels of lithium in municipal drinking water in relation to dementia prevalence. These studies largely investigated the effects of naturally occurring lithium concentrations (μg/L) in water supplies on long-term dementia risk. A nationwide Danish cohort study spanning 1970–2013, which included 73,731 dementia patients and 733,653 controls, found lower lithium exposure among dementia patients (4). While long-term higher lithium exposure appeared to reduce the risk of dementia (particularly AD and vascular dementia), the potential confounding effects of socioeconomic status, nutrition, and genetics could not be excluded. Another study demonstrated that water lithium levels ranging from 0.002 to 0.056 mg/L were associated with lower AD mortality and reduced prevalence of obesity and type 2 diabetes—both known risk factors for AD—whereas levels below 0.002 mg/L were ineffective (5). In contrast, negative studies reporting no association between water lithium and dementia typically involved substantially lower lithium levels (6, 7). Taken together, these findings suggest that adequate long-term lithium exposure through drinking water (>10–15 μg/L) may reduce dementia incidence and AD mortality. Moreover, one study demonstrated that the protective association of water lithium against AD was more pronounced in women, pointing to the need for further research on the interplay of lithium, AD, gender, and hormonal factors (8).

This raises another critical question: in bipolar disorder, where lithium is most widely used, is there a difference in AD risk between patients who do and do not receive lithium treatment? How effectively does lithium preserve cognitive function in this population? Despite some negative findings, the potential protective role of lithium in reducing dementia risk has become increasingly prominent. While bipolar disorder itself, along with multiple associated factors, increases dementia risk, lithium use appears to mitigate this risk (9). Notably, long-term continuous use provides neuroprotective benefits through mechanisms such as GSK3β inhibition and anti-inflammatory effects, whereas short-term or intermittent use does not. Compared to alternative mood stabilizers such as valproate, lithium appears more advantageous in preserving cog-

nitive reserve (10).

Thus, the molecule discovered in 1949 for its antimanic properties—later established as the gold-standard maintenance treatment in bipolar disorder, and the only pharmacologic agent proven to reduce suicide rates—now emerges after 76 years in psychiatry as a potentially transformative intervention in AD and neuropsychiatry, through mechanisms yet to be fully elucidated. For clinicians, the challenge and responsibility lie in using this molecule in appropriate indications while skillfully managing side effects, thereby maximizing its potential to deliver profound therapeutic benefits in select patients.

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Discriminative validity of the Stroop Test Çapa Version for executive function deficits in bipolar disorder

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SUMMARY

Objective: Cognitive impairment is a well-recognized feature of bipolar disorder and has been investigated as a potential endophenotypic marker. The Stroop test is a widely used measure of executive functions, particularly response inhibition and cognitive set shifting. In this study, we aimed to evaluate the Stroop Test Çapa Version by assessing its sensitivity and specificity in detecting executive function impairment in individuals with bipolar disorder during euthymia.

Method: In this retrospective study, 156 euthymic individuals with bipolar disorder type I and 125 healthy controls were included. Receiver Operating Characteristic (ROC) analyses were conducted separately for the completion times of the Stroop A, B, and C subtests, as well as Stroop D, calculated as the difference in reaction time between Stroop C and Stroop B. Optimal, diagnostic, and screening cut-off points were identified for each score type, along with their corresponding sensitivity, specificity, and positive and negative predictive values.

Results: Participants with bipolar disorder required significantly more time to complete all Stroop subtests compared to healthy controls ($p < 0.007$ for all comparisons). Among the subtests, Stroop C demonstrated the highest discriminative ability (AUC = 0.671; $p < 0.0001$), followed by Stroop A (AUC = 0.659; $p < 0.0001$), Stroop D (AUC = 0.649; $p < 0.0001$), and Stroop B (AUC = 0.606; $p = 0.0019$).

Discussion: Our findings indicate that the Stroop Test Çapa Version, when used alone, does not yield high sensitivity or specificity in identifying bipolar disorder. Therefore, it should be integrated with other neuropsychological assessments to enhance the clinical and cognitive evaluation of individuals with bipolar disorder.

Key Words: Bipolar disorder, executive functions, Stroop Test Çapa Version, sensitivity, specificity, discriminative validity

INTRODUCTION

Bipolar disorder (BD) is a lifelong disorder characterized by cyclic episodes of mania and depression, separated by periods of remission. It affects mood, cognitive functions, and overall medical condition, leading to impaired functioning in individuals diagnosed with the disorder. The severity of cognitive dysfunction in BD varies widely; while some individuals maintain intact cognitive abilities, others experience impairments ranging from mild to severe (1). A growing body of research supports the existence of cognitive subgroups within BD, differentiated by the level of cognitive functioning (2,3,4). The extent and progression of cognitive deficits in BD have been explored through both cross-sectional (5,6) and longitudinal studies (7,8,9). Cognitive impairment is prominent during manic and depressive episodes but also persists during the euthymic phase and is considered an endophenotype for BD (10,11,12). During euthymia, the most consistently affected domains are verbal memory, attention, processing speed, and response inhibition, typically with moderate to large effect sizes (10,12,13). Among these, impairments in verbal memory and executive functions

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appear to be the most prominent.

Cognitive impairment negatively affects the psychosocial and occupational functioning of individuals with BD (14,15,16), and it has even been discussed that measured cognitive symptoms may be a better predictor of functioning than measured emotional symptoms (16). Therefore, understanding the nature of cognitive impairment and its contributing factors in BD is essential for developing strategies to prevent cognitive decline and effective treatments.

Yatham et al. (17) conducted a study to develop a standardized research battery including validated cognitive measures for the assessment of cognitive functioning in individuals with BD. This battery, known as the International Society for Bipolar Disorders-Battery for Assessment of Neurocognition, ISBD-BANC, is considered appropriate for use in research settings or large-scale clinical trials where cognitive screening, repeated assessment of cognitive performance, or evaluation of treatment effects is required. One of the study's objectives was to summarize the cognitive domains most significantly impaired in BD and their respective measurements. The cognitive tasks and tests included in the battery were selected based on a review of existing meta-analytic studies. Furthermore, given the overlap in neuropsychological functions between BD and schizophrenia, the Consensus Cognitive Battery and its components—developed through the Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) initiative for clinical research in schizophrenia—were assessed for their applicability in BD. As a result of the evaluation, in addition to the Consensus Cognitive Battery, effective tests were identified in the areas of verbal learning (e.g., California Verbal Learning Test) and executive functions (e.g., Stroop Test, Trail Making Test part B, Wisconsin Card Sorting Test). Researchers have considered that executive functions are not uniformly impaired in all patients with BD and encompass a wide range of higher-level cognitive processes. They have addressed the cognitive tasks defined for different components of executive functions based on the associated neural circuits. The Stroop test has been included among the core subtests identified for executive functions due to its short application time, ease of administration, adequate reliability levels, repeatability, and international applicability (18).

Stroop Test Çapa Version

The Stroop test, designed by John Ridley Stroop in 1935, is a neuropsychological test widely used today in both experimental research and clinical practice in Turkey and worldwide (19). This test generally assesses the ability to inhibit cognitive conflict that arises during the simultaneous processing of two different features of a stimulus, and the effort exerted during this process results in a prolonged response time to complete the task (19).

There are different forms of the Stroop test, such as the Golden form (20) and the Victoria form (21), which differ in terms of the number of stimuli, the type of stimuli, and the order in which the tasks are given (22, 23). The Stroop Test Çapa Version (23) and the Stroop Test TBAG version (24) are commonly used in Turkey. The Stroop Test TBAG version was created by combining the original Stroop and Victoria forms, standardized by calculating norm values and shown to evaluate characteristics similar to other Stroop tests (24). The Stroop Test Çapa Version, on the other hand, is an adaptation of the Stroop test form developed by Weintraub (25) at the Neuropsychology Laboratory of Istanbul University Faculty of Medicine (Çapa) (23). The Stroop Test Çapa Version has certain advantages over the TBAG Version, such as the evaluation of spontaneous corrections and error counts, having fewer subtests, being free of charge, shorter administration time, established normative values stratified by demographic variables, and a higher representational strength for the elderly population (23).

Cognitive Functions Measured by the Stroop Test

The Stroop test primarily measures response inhibition (26, 27) and has been reported to assess cognitive functions such as selective attention (28), information processing speed (29, 30), and cognitive flexibility (29) in the literature. Successful performance on the Stroop task requires the significant use of attention functions. Additionally,

research findings indicate that individual differences in working memory capacity predict performance on the Stroop test (31, 32).

According to Periáñez et al. (33), the subtests of the Stroop test are related to different cognitive functions. For example, the task of reading color names reflects visual scanning speed, while the task of naming colors reflects both working memory and visual scanning speed. The final subtest, which requires participants to name the colors of color names printed in a different color ink, relates not only to these functions but also to the process of conflict monitoring.

The Discriminative Validity of the Stroop Test in Neuropsychiatric Disorders

The Stroop test is considered valid and reliable across various cultures, and its normative values have been established (e.g., 34, 35). However, there is a lack of studies focusing on the sensitivity and specificity of the test. Sensitivity refers to a test's ability to accurately identify individuals who truly exhibit the trait it aims to measure, while specificity pertains to the test's proficiency in recognizing those who do not possess that trait. In the context of neuropsychological tests, a test that achieves high levels of sensitivity and specificity effectively distinguishes between individuals with and without cognitive impairments. These metrics are essential for evaluating the ability of neuropsychological assessments to reflect individuals' real-world performance and reliability. Reliable tests improve data quality in clinical settings and neuropsychological research. According to Sørensen et al. (36), the Stroop interference score of errors distinguishes children diagnosed with attention deficit hyperactivity disorder (ADHD) from children with different diagnoses and children with typical development and predicts impulse control in their daily lives as reported by their parents. This study is the first to show that the number of errors made during this trial is more specific to ADHD diagnosis than a score based on interference time. Other studies have also reported that the Stroop test has good discriminatory value in distinguishing individuals with an ADHD diagnosis from healthy individuals (37). On the other hand, Homack and Riccio's (38) meta-analysis study found that the Stroop test did not show specificity in distinguishing children and adolescents with ADHD diagnoses from other clinical groups, such as learning disabilities, autism, and Tourette syndrome. Thus, the specificity of the Stroop test for ADHD is unclear, and it is insufficient for ADHD diagnosis.

Lubrini et al. (39) reported that individuals with traumatic brain injury (TBI) and schizophrenia scored lower than healthy controls on all test conditions in the Stroop test, demonstrating the test's ability to distinguish these individuals from healthy individuals. The Serial Color-Word Test has been shown to be successful in classifying severe illnesses such as schizophrenia and BD, but it has not been able to successfully distinguish individuals with schizophrenia from those with BD in all cases (40). The Stroop test was examined for its sensitivity and specificity in cognitive screening among a sample of elderly adults with severe psychiatric disorders, but its effectiveness in this group was found to be lacking (41). The researchers concluded that more studies are necessary to assess whether the Stroop test could be useful in clinical settings, especially considering its short administration time and strong psychometric properties.

As can be seen from the research results presented above, the sensitivity of the Stroop test may be stronger than its specificity (20). Consistent with this view, Stroop test performance has been similarly impaired across different age ranges in many neuropsychiatric disorders associated with functional and structural changes in the brain, particularly in the frontal areas (38). Snyder, Miyake, and Hankin (42) and Zelazo (43) also note that executive function impairments are a transdiagnostic marker of atypical development and various psychiatric disorders, emphasizing the need for better assessment of executive functions in these disorders.

In studies conducted in Turkey for various purposes using different forms of the Stroop test, individuals diagnosed with BD demonstrated poorer performance compared to healthy controls (44,45). On the other hand, some studies have found no statistically significant differences in Stroop perfor-

mance between individuals with BD and healthy control groups (46,47). No studies have examined the sensitivity and specificity of the Stroop test in BD.

Purpose of the Study

Neuropsychological assessment is considered a crucial component in the diagnostic evaluation and monitoring of mood disorders, such as BD. However, there are currently no established gold-standard tools for assessment (48). Consequently, it is essential to identify valid and reliable tests that can effectively differentiate individuals with BD from those who are healthy. These tests may significantly contribute to the early detection of the disorder, aid in diagnosing cognitive impairment accurately, and assist in cognitive rehabilitation planning. In particular, further research is necessary to evaluate the sensitivity and specificity of neuropsychological tests assessing executive functions, which are known to be significantly affected in BD.

The current study aims to evaluate the sensitivity and specificity of the Stroop Test Çapa Version (23), which is commonly used to assess executive functions in Turkey. It specifically aims to determine how effectively this test identifies executive function impairments in individuals diagnosed with BD during the remission period, and how it differentiates these individuals from healthy participants.

METHOD

Study Design and Sample

This retrospective study has received approval from the Koç University Clinical Research Ethics Committee under protocol number 2024.351.IRB2.150. Data were collected from 156 individuals diagnosed with BD type I and 125 healthy controls. These participants were involved in two large-scale research projects conducted separately in 2007 and 2018 at the Department of Neuroscience, Institute of Health Sciences, Dokuz Eylül University. The results of these comprehensive studies, which utilized this data, have been previously published (49, 50). Participants with BD were recruited from the Department of Psychiatry at Dokuz Eylül University Hospital, while the control group was formed through announcements circulated among students and staff at Dokuz Eylül University.

The inclusion criteria applicable to both studies are: having a diagnosis of bipolar disorder type I according to the Diagnostic and Statistical Manual of Mental Disorders-IV-TR (DSM-IV-TR) diagnostic criteria, being in the remission phase for at least 6 months [(Hamilton Depression Scale (HAM-D-17) and Young Mania Rating Scale (YMRS) scores ≤ 7)] and not having received any other psychiatric Axis I diagnosis other than BD. The healthy control sample comprises individuals identified as having no psychiatric disorders, as assessed through the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) in related projects. Furthermore, the control group's subjective complaints were evaluated, and only those without any concerns regarding cognitive functions were selected. Individuals with hearing and visual impairments that could interfere with neuropsychological assessments, as well as those with mental retardation, degenerative neurological diseases, cerebrovascular diseases, brain surgery, epilepsy, cerebral tumors, or a history of head trauma resulting in loss of consciousness, were excluded from the study. Additionally, individuals who had a history of alcohol or substance abuse within the year prior to the studies were also excluded. All participants in the BD diagnosis group are receiving one or more drug treatments. Detailed demographic characteristics and Stroop Test Çapa Version scores for all participants aged 18 to 65 are presented in Table 1.

Data Collection Tools

The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I): SCID-I is a semi-structured interview technique created by First et al. (51) to assess first-axis psychiatric disorders based on DSM-IV criteria. A study validating and testing its reliability in Turkish was conducted by Özkürkçügil et al. (52).

Table 1. Demographic Characteristics and Stroop Test Capa Version Scores of Study Participants

	Participants with BD (n=156)	Healthy Controls (n=125)	*p*
Age (Years)	35.63 ± 9.92	33.33 ± 10.87	0.065
Gender (M/F)	63/93	49/76	0.840
Education (Years)	12.65 ± 3.59	13.31 ± 3.66	0.144
Stroop A	40.92 ± 10.66	35.63 ± 6.61	<0.001
Stroop B	30.76 ± 7.30	28.58 ± 6.93	0.006
Stroop C	76.94 ± 23.10	65.80 ± 18.66	<0.001
Stroop D	46.40 ± 20.02	37.22 ± 15.54	<0.001

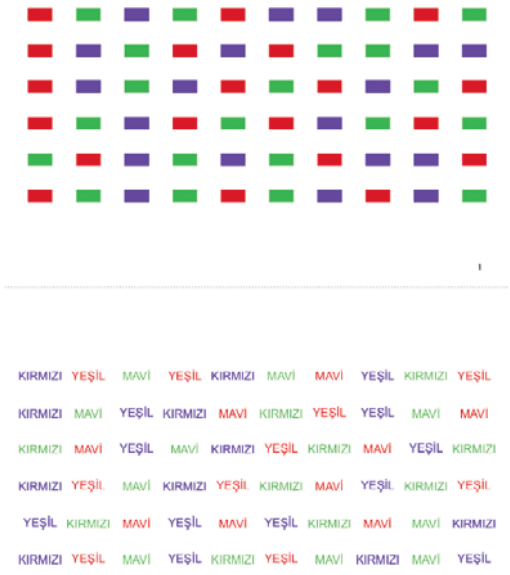
Values are presented as mean ± standard deviation. The completion times of Stroop A, B, and C subtests and the calculated Stroop D time are in seconds. Age, education, and completion times were analyzed with independent samples t-tests, while gender was assessed using a Pearson x^2 test. BD: Bipolar Disorder, M: Male, F: Female.

Hamilton Depression Rating Scale-17 (HDRS-17): Max Hamilton (53) developed the 17-item HDRS, which clinicians frequently use to assess the presence or absence of depressive symptoms and their severity at mild, moderate, or severe levels. The scale consists of 17 items and assesses depressive symptoms experienced in the past week. Its total score ranges from 0 to 53. Akdemir et al. (54) conducted the Turkish validity and reliability study.

The Young Mania Rating Scale (YMRS): YMRS was developed by Young et al. (55) to assess the severity of manic symptoms. This scale is based on both interviews and observations and consists of a total of 11 items. Among these, seven items use a five-point Likert scale, while the remaining four use a nine-point Likert scale. Scoring is determined by the clinician's observations during the interview and the patient's self-reported symptoms from the past 48 hours. The total score on the scale ranges from 0 to 60. A Turkish validity and reliability study was conducted by Karadağ et al. (56) in 2001.

Stroop Test Çapa Version: The validity, reliability, and normative study was conducted by Emek Savaş et al. (23) with a large sample size of 541 participants. The test includes two stimulus cards (see Figure 1) arranged in a 6×10 format, totaling 60 items, and an application form for recording responses. The first card features rectangular boxes in red, green, and blue colors; the second card features color names printed in incongruent colors (e.g., the word "green" printed in blue ink). The test is divided into three sequential subtests. Table 2 provides information about these subtests, the tasks for each section, and the types of scores recorded.

In the literature, the Stroop test's "interference" time and "resistance to interference" time are utilized to evaluate challenges in response inhibition, which typically refers to the suppression of behaviors that are incompatible with a given task. The Stroop Test "interference" time is typically expressed as the time spent in trials where the colors of ink printed in incongruent colors are named, while the Stroop test "resistance to interference" time is based on a calculation derived from the difference between the times spent in different parts of the test. The equivalents of these two scores in the Stroop Test Çapa Version are Stroop C and Stroop D scores, respectively. According to Emek Savaş et al. (23), the interference part of the Stroop test, as a distinct function from the other parts, evaluates the suppression of automatic responses and the generation of unfamiliar new responses. Therefore, the Cronbach's alpha coefficient calculated for all subtests was higher when the interference part was not included. In addition, it has been shown that the test-retest reliability is high



Resource: Emek Savaş DD, Yerlikaya D, G Yener G, Öktem Tanör Ö. Validity, reliability and normative data of the Stroop Test Çapa Version. Turk Psikiyatri Derg 2020; 31(1):9-21

Figure 1. Stroop Test Çapa Version Stimulus Cards.

Table 2. The Stroop Test Capa Version Subtests, Tasks, and Score Types

Stimulus card	Subtests	Tasks	Score Types
1	Stroop A	The individual is asked to name the colors of the small rectangular boxes in the order shown.	Completion time
2	Stroop B	The individual is asked to read color names printed in incongruent colors in the order shown.	Completion time
2	Stroop C	The individual is asked to name the color of the colored words printed in incongruent colors, following the order shown.	Completion time, number of errors and spontaneous corrections
Stimulus card	Subtest	Calculation	Calculated score type
-	Stroop D (resistance to interference time)	The difference between the completion times for Stroop C and Stroop B subtests is calculated (Stroop D=Stroop C-Stroop B).	Time

and/or sufficient for the 18-49 age group and the 50 and older age group, which were examined separately. Test-retest reliability coefficients for Stroop A, B, C, and D subtests ranged from 0.67 to 0.88 for individuals aged 18-49 and from 0.64 to 0.84 for individuals aged 50 and older (23). Furthermore, correlations calculated between Stroop C completion times and the Trail Making Test part A completion time (r = 0.60), part B completion time (r = 0.65), and the B-A time difference (r = 0.57) were found to be moderate for the concurrent validity of the form. These concurrent validity and reliability values indicate that the Stroop Test Çapa Version has strong psychometric properties.

Procedure

In both studies that used the data (49, 50), individuals diagnosed with BD and healthy participants who met the inclusion criteria were provided with comprehensive information about the research and gave written informed consent. Clinical interviews with participants were conducted at the Department of Psychiatry at Dokuz Eylül University Hospital, while neuropsychological testing took place at the Department of Neuroscience within the Institute of Health Sciences at Dokuz Eylül University. Trained psychiatrists conducted all SCID-I interviews, and the diagnoses of individuals with BD and the absence of any other concurrent Axis I psychiatric diagnosis were confirmed through these interviews. Clinical scales were administered, and individuals who scored 7 or below on these scales and had been in remission for at least six months were referred for a neuropsychological assessment after their demographic information was collected. Similarly, healthy controls, determined to have no psychiatric disorders through SCID-I interviews, were also referred for neuropsychological assessment following the collection of their demographic details. The neuropsychological assessment included tests evaluating attention, memory, executive functions, visual-spatial functions, and language skills. Experienced neuropsychologists administered the tests to both groups in a single session, following a standardized sequence. Psychiatrists and neuropsychologists were informed about the purpose of the study. The data from both studies described above were combined for this study, and individuals with complete Stroop Test Çapa Version scores formed the study sample.

Statistical Analyses

The groups' age, education, and Stroop Test Çapa Version subtest completion times were compared using an independent samples t-test, and the gender variable was compared using a Pearson χ^2 test (see Table 1). The study's dependent variable is a binary variable indicating the diagnostic group (bipolar disorder = 1; healthy control = 0). The independent variables are continuous variables, including the completion times for the Stroop A, Stroop B, and Stroop C subtests of the Stroop Test Çapa Version and the calculated Stroop D time. The normality assumption was assessed using histograms, Q-Q plots, and skewness-kurtosis coefficients, revealing a right-skewed distribution in the completion times for all subtests. The Levene test was conducted to examine the equality of variances. In cases where this assumption was violated, the Welch's t-test was applied to the subtests.

To evaluate the discriminative ability of the Stroop Test Çapa Version in BD, receiver operating characteristic (ROC) curves and the area under the

Table 3. Cut-off points for the Stroop Test Capa Version subtests for healthy controls and participants with bipolar disorder

	Optimal Cut-off Point	Diagnostic Cut-off Point	Screening Cut-off Point	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	AUC (C.I.)
Stroop A	>38			51.28	72.80	70.02	54.5	0.659 (0.600-0.714)
		>40		41.03	**80.00**	71.9	52.1	
			>32	**82.05**	35.20	61.2	61.1	
Stroop B	>27			66.03	55.20	64.8	56.6	0.606 (0.546-0.663)
		>33		28.21	**80.80**	64.7	47.4	
			>24	**83.33**	28.80	59.4	58.1	
Stroop C	>74			48.08	79.20	74.3	55.0	0.671 (0.613-0.726)
		>75		46.79	**80.00**	74.5	54.6	
			>59	**80.77**	40.00	62.7	62.5	
Stroop D	>41			53.85	71.20	70.0	55.3	0.649 (0.590-0.705)
		>45		41.03	**80.00**	71.9	52.1	
			>30	**81.41**	31.20	59.6	57.4	

PPV: Positive predictive value, NPV: Negative predictive value, AUC: Area under the curve, C.I.: Confidence interval.

curve (AUC) with a 95% confidence interval were calculated for each independent variable. For each metric, the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were calculated. The PPV represents the likelihood that individuals identified as having bipolar disorder by the test indeed possess the disorder, whereas the NPV indicates the probability that individuals categorized as negative by the test are genuinely healthy. Furthermore, optimal, diagnostic, and screening cut-off points were established for each metric. The optimal cut-off point was defined as the value at which sensitivity and specificity intersect, utilizing the Youden Index for this determination. The Youden Index (J = sensitivity + specificity − 1) is a measure that ranges from 0 to 1 and is calculated for each possible cut-off point on the ROC curve. A J value of 0 indicates no discriminative power, while a J value of 1 indicates perfect classification. The optimal cut-off point is identified as the point farthest from the main diagonal of the ROC curve, which represents random classification and corresponds to the highest J value. The diagnostic cut-off point is defined as the threshold at which specificity reaches 80% or higher. Conversely, the screening cut-off point is established when sensitivity reaches 80% or higher. Descriptive statistics and group comparisons were conducted using SPSS 29 software, while ROC analyses were carried out using MedCalc 23.1.1 software. A two-tailed $p<0.05$ was accepted as the significance level for all statistical tests.

RESULTS

In the study, individuals diagnosed with BD and healthy controls exhibited comparable characteristics regarding age ($p=0.065$), gender ($p=0.840$), and education ($p=0.144$). It was found that the BD group took significantly longer to complete all subtests of the Stroop Test Çapa Version compared to the control group ($p<0.007$ for all; Table 1).

The discriminant validity of the Stroop Test Çapa Version was assessed through ROC analyses. The highest AUC value for differentiating the BD group from healthy controls was observed in the Stroop C subtest (AUC = 0.671; $p < 0.0001$). This was followed by Stroop A (AUC = 0.659; $p < 0.0001$), Stroop D (AUC = 0.649; $p < 0.0001$), and Stroop B (AUC = 0.606; $p = 0.0019$). The AUC represents the probability that the test duration of an individual randomly selected with a BD diagnosis exceeds that of a randomly selected healthy individual. AUC values are interpreted as follows: an AUC of 0.50 indicates no discriminative power (random chance); 0.60-0.70 reflects weak to moderate discriminative ability; 0.70-0.80 signifies good discrimination; 0.80-0.90 suggests very good discriminative capacity; and an AUC of ≥ 0.90 denotes excellent discriminative ability. For instance, an AUC value of 0.66 implies that the test demonstrates moderate discriminatory power, indicating a 66% probability that an individual with a BD diagnosis will have a more extended test duration than a healthy individual. While this level of discrimination is significantly better than chance (50%), it has not yet reached a clinically excellent standard.

ROC curves for individuals with BD and healthy controls are shown in Figure 2. The optimal, diagnostic, and screening cut-off points determined for each subtest are presented in Table 3 along with sensitivity, specificity, PPV, and NPV values.

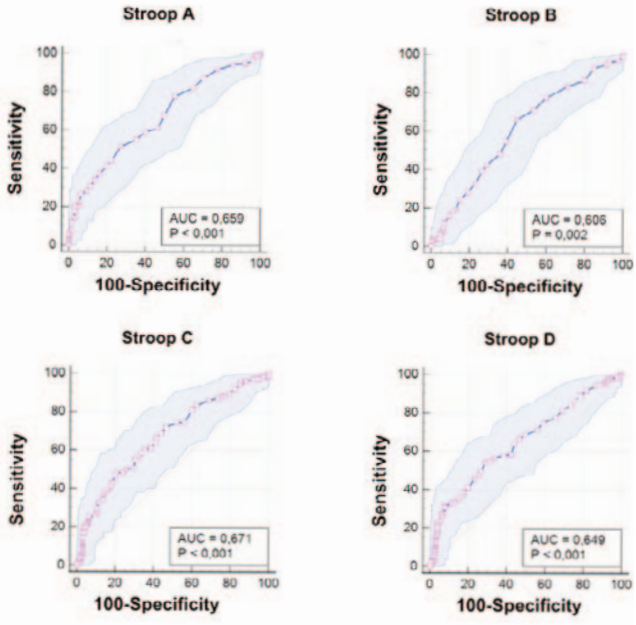


Figure 2. ROC curves comparing participants with bipolar disorder to healthy controls.

The cut-off points presented in Table 3 summarize the diagnostic performance across various clinical scenarios. For instance, the optimal cut-off point for the Stroop C subtest is greater than 74 seconds. At this threshold, the sensitivity is 48%, the specificity is 79%, the PPV is 75%, and the NPV is 55%. This indicates that the test correctly identifies nearly half of the individuals with BD, and three out of four individuals who test positive are confirmed BD cases. In scenarios where the specificity is at least 80%, adjusting the cut-off point to greater than 75 seconds leads to a decrease in sensitivity to 47%. While this adjustment minimizes the risk of misdiagnosing healthy individuals, it unfortunately leads to the underdiagnosis of half of the BD cases. In situations that require high sensitivity for screening, setting the threshold to greater than 59 seconds increases the sensitivity to 81%. However, this raises the risk of reducing specificity to 40%. The Stroop A and Stroop D subtests demonstrate a similar trade-off between sensitivity and specificity, while Stroop B consistently shows lower sensitivity, remaining below 50%. The other panels (Stroop A, B, and D) in Table 3 should be interpreted with similar consideration.

DISCUSSION

The aim of this study was to assess the sensitivity and specificity of the Stroop Test Çapa Version for detecting executive function impairment in euthymic individuals with BD and differentiating them from healthy controls.

The findings show that the BD group completed all subtests of the Stroop Test Çapa Version (Stroop A, B, C, and D) longer than healthy controls. The AUC values obtained from ROC analyses were above 0.6, indicating an acceptable level. This result demonstrates that the performance of individuals diagnosed with BD differs significantly from that of healthy individuals regarding executive functions and that the Stroop Test Çapa Version has a certain discriminative power in distinguishing between BD and healthy individuals. These findings are consistent with existing results indicating that cognitive functions are impaired in bipolar disorder when compared to healthy individuals, and that this cognitive impairment can be observed before the onset of the disease, at the onset of the disease, and during periods of remission throughout the disease (10). Furthermore, most studies conducted during the remission phase indicate that the impact of medication on ongoing cognitive impairment during this phase is minimal (14,57,58).

The highest AUC value was observed for the Stroop C (interference) subtest in the study. The literature indicates that the Stroop C subtest demands greater executive functioning and response inhibition because it involves color names printed in incongruent ink colors (23). Considering that BD is particularly associated with difficulties in emotion regulation and cognitive flexibility, it is consistent that Stroop C is more sensitive in distinguishing the BD-diagnosed group from healthy controls.

The fact that Stroop A and D subtests also have significant AUC values indicates that color naming and resistance to interference times also have partial discriminatory power. However, the low AUC value observed for Stroop B suggests that the task of reading color names requires relatively less cognitive effort. As a result, it may provide lower discriminative power in distinguishing between BD cases and healthy controls.

The results of optimal, diagnostic, and screening cut-off points show that Stroop test times alone cannot achieve high sensitivity and specificity values. This indicates that the test may serve as an auxiliary tool in a general screening or clinical evaluation process rather than as a diagnostic instrument. However, identifying different cut-off points targeting ≥80% specificity or ≥80% sensitivity may guide clinicians in diagnostic processes requiring high specificity or screening purposes requiring high sensitivity. Furthermore, given BD's complex clinical picture and heterogeneous nature, it is beneficial to evaluate the Stroop Test Çapa Version as part of a comprehensive neuropsychological assessment battery rather than as a standalone determinant. These findings are consistent with Golden's (20) view that the Stroop test can be used as part of a larger battery to screen for brain dysfunction.

To our knowledge, there are currently no studies in Turkey that examine the sensitivity and specificity of the Stroop test in individuals diagnosed with BD, which can be used to compare with the findings of the present study. On the other hand, the Stroop test is used in numerous studies examining cognitive impairment as an endophenotypic marker for BD (12). Recent discussions and studies have focused on whether cognitive impairment in BD is progressive, often referred to as cognitive neuroprogression (59). Researchers are also examining subgroups of individuals with cognitive differences in BD, highlighting the heterogeneity of etiological and genetic risk factors associated with the disorder (2,3,60). As a result, investigating tests that effectively measure cognitive functions has become increasingly important. For instance, a recent meta-analysis by Bora (60) identified three cognitive subtypes of BD. Approximately one-third of individuals with BD demonstrate good overall functioning and cognitive performance, exhibiting a slight increase in executive function compared to healthy control groups. The same meta-analysis showed that approximately one-quarter of these individuals experienced impairment comparable to that seen in individuals diagnosed with schizophrenia in six cognitive domains, including executive functions. Based on these results, the use of appropriate and valid tests when assessing executive functions and their subcomponents in BD is critical, both because of the significant impact of these functions on psychosocial functioning and daily life (61) and for the identification and determination of cognitive subgroups.

The findings of this study support the applicability, validity, and reliability of the Stroop Test Çapa Version (23) for neuropsychological assessment in individuals with BD. Key strengths of the study include the careful matching of the BD group to healthy control participants based on age, education, and gender, as well as a substantial sample size. However, several limitations should be noted. The retrospective design of the study, along with the broad time span over which participants were evaluated, may have restricted the collection of detailed information regarding the disease progression. In addition, the use of the fourth edition (DSM-IV) of the Diagnostic and Statistical Manual of Mental Disorders, which was valid at the time the data were collected, rather than the current fifth edition (DSM-5) for diagnostic interviews and inclusion criteria, may be considered a limitation. Furthermore, the lack of comparisons with other executive function tests beyond the Stroop Test Çapa Version somewhat limits the test's specificity. Another limitation of the study is that individuals with BD were not compared with participants having other neuropsychiatric diagnoses, making it challenging to assert that the results are exclusive to BD. In addition, participants with BD were receiving pharmacological treatment and constituted a highly heterogeneous group in terms of medication types and monotherapy versus polytherapy. The neuroprotective or neurotoxic effects of these medications on cognitive functions remain a topic of considerable debate (62,63). The failure to assess medication effects due to the diversity of drug use in the sample group further constitutes a limitation of this study.

Future research should integrate neuropsychological test batteries with neuroimaging techniques to provide a more comprehensive understanding of cognitive processes in BD. Studies focusing on different age groups or illness stages may help establish more specific cut-off points for the Stroop Test Çapa Version.

In conclusion, the Stroop Test Çapa Version demonstrates a notable level of discriminant validity in differentiating individuals diagnosed with BD Type I from healthy controls. Specifically, the Stroop C subtest appears to be more sensitive than the other subtests in reflecting the cognitive differences associated with BD, particularly regarding cognitive interference and response inhibition processes. However, rather than relying on the Stroop test as a standalone diagnostic tool, it is recommended to incorporate it into a comprehensive neuropsychological assessment. For instance, the Stroop test may be employed in longitudinal studies examining cognitive functioning in individuals at high risk for BD, as well as in large-scale research comparing cognitive subgroups within BD in terms of cognitive efficiency. The present study holds particular relevance for neuropsychologists and clinicians in Turkey who use the Stroop Test Çapa Version, as it contributes to a better understanding of the test's sensitivity and specificity. Such knowledge supports the appropriate selection of assessment tools and promotes accurate interpretation of results.

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Examining prodrome symptoms of bipolar disorder in young adult patients with obsessive compulsive disorder

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SUMMARY

Objective: Obsessive-Compulsive Disorder (OCD) and Bipolar Disorder (BD) frequently co-occur. While several studies suggest a temporal and clinical relationship between the two disorders, little is known about the presence of prodrome BD symptoms in individuals with OCD. This study aimed to examine whether young adults diagnosed with OCD exhibit elevated levels of prodrome symptoms of BD compared to psychiatrically healthy controls.

Method: A total of 66 participants aged 18–25 were included: 31 with a diagnosis of OCD and 35 healthy controls. Bipolar prodrome symptoms were assessed using Bipolar Prodrome Symptom Scale (BPSS). Yale-Brown Obsessive Compulsive Scale (Y-BOCS), Hamilton Depression Rating Scale (HDRS), and Young Mania Rating Scale (YMRS) were also administered. Group differences were analyzed using Mann-Whitney U test; associations between OCD severity and prodromal symptoms were examined using Spearman correlation.

Results: OCD participants demonstrated significantly higher scores on both the frequency ($U = 251.50$, $p < .001$, rrb $= .60$) and severity ($U = 203.50$, $p < .001$, rrb $= .62$) subscales of BPSS compared to control group. In the total sample, OCD symptom severity was moderately correlated with BPSS severity ($r = .58$, $p < .001$) and frequency ($r = .53$, $p < .001$). However, within the OCD group alone, these correlations did not reach statistical significance. When Expectation Maximization correction was applied, similar association patterns were observed.

Discussion: This is one of the first studies in the literature investigating BD prodrome symptoms in young adult OCD patients. Young adults with OCD exhibit elevated levels of bipolar prodrome symptoms relative to healthy individuals. The absence of within-group correlations and the cross-sectional design limit causal interpretation. Clinicians should consider monitoring prodrome bipolar symptoms in OCD patients, particularly during the late adolescent and early adult years. Future studies with larger sample sizes are needed to confirm the reliability and validity of the findings.

Key Words: Obsessive compulsive disorder, bipolar disorder, bipolar prodrome symptom

INTRODUCTION

Studies on the antecedents of a mental illness and the spectrum of mental disorders have attracted increasing attention in recent years. A large-scale cohort study shows that individuals diagnosed with OCD or BD for the first time are at risk for the subsequent development of both disorders. The study found that the risk of BD was 13 times higher in individuals with OCD. Moreover, individuals who initially receive an OCD diagnosis have a higher likelihood of later being diagnosed with BD compared to those who are first diagnosed with BD and later develop OCD. When the effect of SSRI use was controlled for, the risk of developing BD after an OCD diagnosis decreased but did not disappear completely. (1).

Although BD is considered a common comorbidity in OCD patients, the significance of this comorbidity is not fully understood. The uncertainty lies in whether the high comorbidity reflects the frequent co-occurrence of two independent disorders or the manifestation of certain symptoms of a different disorder (2). One study viewed this situation as OCD being a precursor to BD (3). Some researchers propose that BD may underlie OCD (4) and that certain cases of OCD should be recon-

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sidered as BD (5). Furthermore, it has been proposed that OCD is etiologically associated with BD and may function as an independent risk factor for its onset. (1). Moreover, a significant inverse relationship has been observed between age and OCD-BD comorbidity (6), with higher comorbidity rates observed in younger individuals compared to adults (2). Therefore, it has been posited that early OCD symptoms may indicate a predisposition to BD in later years; however, these symptoms tend to decrease as individuals transition into adulthood (7).

Understanding the comorbidity of OCD and BD is crucial for both nosology and clinical practice. More robust evidence regarding the comorbidity of BD and OCD is needed to provide a clearer clinical diagnosis and enable more accurate therapeutic approaches (8). The literature, particularly concerning the comorbidity of BD in individuals with OCD as the primary diagnosis, remains limited (9). Moreover, due to the high risk of severe illness symptoms and significant functional impairment in individuals with OCD-BD comorbidity, it is vital to screen OCD patients for BD (10).

It is proposed that, although insufficient in terms of frequency, severity, or duration to diagnose BD, certain prodrome symptoms exist that indicate a high risk for the subsequent transition to BD (11). Anxiety symptoms have emerged as a risk factor in studies examining prodrome BD symptoms (12, 13, 14). In this context, Du and colleagues emphasized that examining prodrome symptoms emerging as anxiety could have significant implications for the treatment and course of BD. Their study suggested that anxiety disorders, including OCD, may be part of the prodromal phase or an atypical presentation of BD (15).

In light of the existing literature, this study seeks to explore the association between OCD and prodrome symptoms of BD, aiming to address the question: "Do individuals with OCD exhibit more prodrome features of BD compared to those without OCD?". The study aims to screen for bipolar prodrome symptoms in young adult OCD patients. The following hypotheses have been developed in line with this aim:

Hypothesis 1: OCD patients exhibit significantly higher levels of bipolar prodrome symptoms compared to healthy individuals.

Hypothesis 2: There is a significant positive correlation between OCD scores and bipolar prodrome symptom scores.

In this study, the focus is on young adult OCD patients, with particular attention to the potential overlap in the occurrence of OCD and BD, given that BD typically emerges during late adolescence or early adulthood (16, 17) and that comorbidity between OCD and BD has been observed during this period (2, 6, 7). Additionally, this study represents, to our knowledge, the first direct investigation the prodrome symptoms of BD in OCD, differentiating it from Du et al.'s (15) study. While Zutshi et al. discussed temporal precedence in diagnosis (3), the relationship between the transition from OCD to BD was not examined. Thus, the results of this study will offer valuable insights for both theoretical understanding and clinical application.

METHODS

Participants

The study group consisted of patients diagnosed with OCD between the ages of 18-25 who were followed up in a single private psychiatric outpatient clinic. Patients between the ages of 18-25 who applied to the clinic between December 2021 and May 2022 were evaluated by psychiatric physician M.Y. according to the semi-structured DSM 5 criteria and patients diagnosed with OCD were included in the study. The clinical state of OCD participants (i.e., whether they were in active symptomatology or remission) was not assessed at the time of evaluation. All participants had a current diagnosis of OCD and were undergoing treatment, but symptom severity at the time of assessment was not formally recorded. Absence of psychiatric disorders in the control group was established via self-report and supported by low scores on clinician-administered and self-report scales used in the study. Consent form and scales were administered to the patients in the presence of M.Ö. The control

group consisted of individuals between the ages of 18 and 25 who did not have symptoms of psychiatric disorder during the same time period. Exclusion criteria were the presence of another psychiatric comorbidity in the patient group and a family history of bipolar disorder. Exclusion criteria for the control group were the presence of any psychiatric disorder symptoms in addition to these. Participation in the study was voluntary.

Measurement Tools

Bipolar Prodrome Symptom Scale (BPSS): The scale developed by Correll and colleagues in 2014 for screening and detecting early symptoms of bipolar disorder has a Cronbach's alpha coefficient ranging from 0.74 to 0.89 (18). The reliability and validity of the scale in Turkish were examined by Aydemir and colleagues (19). The scale is a 6-point Likert type, consisting of 14 items, each rated from 0 to 5. It is scored separately for the severity and frequency subscales. A score of 17 or higher on the frequency subscale and 39 or higher on the severity subscale indicate a risk for bipolar disorder. The Cronbach's alpha coefficient for the scale was calculated as 0.969 for the frequency subscale and 0.979 for the severity subscale. In the present study, the Cronbach's alpha values were found to be 0.875 for the severity subscale and 0.896 for the frequency subscale.

Hamilton Depression Rating Scale (HDRS): This scale, developed by Hamilton (20) to measure the severity of depression symptoms, had a Cronbach's alpha internal consistency coefficient of 0.75 and test-retest reliability of 0.85 according to the Turkish validity and reliability study (21). It consists of 17 items and is rated by an expert. The rating uses a 5-point Likert scale, with scores ranging from 0 to 4. A score between 0 and 7 indicates the absence of depression, a score between 8 and 15 indicates minor depression, and a score of 16 or higher indicates major depression. In the present study, the Cronbach's alpha value was found to be 0.793.

Young Mania Rating Scale (YMRS): This is an 11-item, 5-point Likert scale developed by Young and colleagues (22) to measure the severity of manic episodes. The scale's Turkish validity and reliability were evaluated by Karadağ and colleagues (23), and it has an internal consistency coefficient of 0.79. In the present study, the Cronbach's alpha value was found to be 0.608.

Yale-Brown Obsession-Compulsion Scale (Y-BOCS): The scale developed by Goodman and colleagues (24) was adapted for Turkish by Karamustafalıoğlu and colleagues in 1993 (25). The Cronbach's alpha coefficient was calculated as 0.81. It is a 19-item, 5-point Likert scale in a semi-structured interview format, used to assess the severity and type of obsessive-compulsive symptoms. In the present study, the Cronbach's alpha value was found to be 0.969.

Data Collection

After obtaining the necessary permissions from the Ethics Committee of Antalya Bilim University, data collection commenced. The control group was selected through convenience sampling, while individuals aged 18-25, diagnosed with OCD and receiving treatment at Private Therapy Medicine Center in Antalya between December 2021 and May 2022, were contacted for the OCD group. To obtain participants' voluntary consent and provide information about the study and their rights, an Informed Consent Form was first provided. Those who agreed to participate were given the Demographic Information Form and the self-report scale, the Bipolar Prodrome Symptom Scale (BPSS). Subsequently, the HDRS, the YMRS, and the Y-BOCS, administered by a clinician, were completed. The Turkish versions of the scales, for which validity and reliability tests had been conducted, were used in the study. Completing the scales and conducting the interviews took approximately 50 minutes.

Statistics

The analysis of the data was performed using IBM SPSS Statistics 26. First, To explore the demographic characteristics of the participants, frequency and percentage analyses were conducted. The chi-square test or Fisher's exact test was used to compare categorical variables. Since the study has

a limited sample size, it was important to assess the distribution of the dependent variables in order to select an appropriate statistical method. Therefore, the assumption of normality was tested, and a normality test was applied. Based on the Shapiro-Wilk test results, the distributions were found to deviate from normality. Thus, in order to analyze the differences in bipolar prodrome scores between the OCD and healthy groups, the non-parametric Independent Samples Mann-Whitney U Test was used. Effect sizes were calculated as rank-biserial correlations using the formula. The Spearman Correlation Test was applied to examine the relationship between OCD scores and bipolar prodrome scores. When variables are measured within a restricted range, the resulting correlations are expected to be attenuated compared to those observed in the general population due to this limitation in score variability (26). A key issue in the present study concerns the estimation of the correlation between OCD symptoms and bipolar prodrome symptom scores based on a restricted sample, specifically when analyses are conducted exclusively within the OCD group. Correction methods exist to address such range restriction (27). In this study, a missing data approach was employed: maximum likelihood estimates via the Expectation-Maximization (EM) algorithm were applied specifically to the bipolar prodrome scores of the control group. The EM procedure was utilized to impute missing values on the frequency and severity subscales of the BPSS within the control group. These corrected scores were used only in the correlation analyses involving the OCD group, while analyses of the total sample relied on the original data.An alpha level of 0.05 was set for all statistical tests.

RESULTS

The study sample consists of 31 participants diagnosed with OCD and undergoing treatment, as well as 35 healthy controls. Among the participants, 39 are female and 27 are male. The average age of the participants was 22.71±2.64 in the OCD group and 21.51±2.63 in the control group. 55% of the participants have completed high school, and 56% are currently continuing their education. 44% of the participants are actively engaged in the workforce. The groups showed no significant differences in gender, age, educational level, or professional and academic status. Participants in the control group have never been diagnosed with any psychiatric disorder and have not sought psychiatric assistance during their lifetime. In contrast, all participants in the OCD group are currently receiving psychiatric treatment. Specifically, 19 individuals are undergoing medication therapy, 3 individuals are receiving psychotherapy, and 9 individuals are receiving combined treatment. Table 1 presents the sociodemographic characteristics of the participants.

Table 1. Distribution and comparison of sociodemographic characteristics

	OCD Group (n = 31) n (%)	Control Group (n = 35) n (%)	p
Gender			0,496*
Female	20 (64.5)	19 (54.3)	
Male	11 (34.5)	16 (45.7)	
Educational Level			0,437**
Middle School	4 (12.9)	0 (0)	
High School	11 (35.5)	25 (71.4)	
Associate degree	1 (3.2)	1 (2.9)	
Bachelor's Degree	15 (48.4)	7 (20)	
Master's Degree	0 (0)	2 (5.7)	
Student			0,853*
Yes	14 (45.2)	23 (65.7)	
No	17 (54.8)	12 (34.3)	
Employment			0,853*
Yes	14 (45.2)	15 (42.9)	
No	17 (54.8)	20 (57.1)	
Type of Treatment			
Medication	19 (61.3)	0 (0)	
Psychotherapy	3 (9.7)	0 (0)	
Medication and Psychotherapy	9 (29)	0 (0)	
None	0 (0)	35 (100)	
	Mean–SD	Mean–SD	
Age	22,71–2,64	21,51–2,63	0,058***

* Chi-square test **Fisher s exact test ***Mann-Whitney U

Table 2. Group Comparisons: Mann-Whitney U Test Analysis Results

	Group	n	Median	Mean Rank	U	r_{rb}	p
BPSS_Severity	OCD	31	26	44.44	203.50	0.63	< .001
	Control	35	12	23.81			
BPSS_Frequency	OCD	31	28	42.89	251.50	0.54	< .001
	Control	35	11	25.19			
HDRS	OCD	31	8	43.60	229.50	0.58	< .001
	Control	35	4	24.56			
YMRS	OCD	31	2	39.48	357	0.34	.014
	Control	35	1	28.20			
Y-BOCS	OCD	31	16	51	.000	1.00	< .001
	Control	35	0	18			

BPSS: Bipolar Prodrome Symptom Scale; HDRS: Hamilton Depression Rating Scale; YMRS: Young Mania Rating Scale; Y-BOCS: Yale-Brown Obsessive-Compulsive Scale
n: Number of participants in each group

Differences between the OCD and control groups were assessed using the Mann-Whitney U Test. The results revealed statistically significant differences between the groups (Table 2). In the analysis of bipolar prodrome symptoms, for the severity subscale, the OCD group (M=26) exhibited significantly higher severity of prodrome symptoms compared to the control group (M=12) (U=203.50, $p < 0.001$, rrb = 0.63). Similarly, in the comparison of the frequency of bipolar prodrome symptoms, the OCD group (M=23) showed significantly higher frequency of prodrome symptoms than the control group (M=11) (U=251.50, $p<0.001$, rrb = 0.54). Regarding depression scores, the OCD group (M=8) demonstrated significantly higher depression scores compared to the control group (M=4) (U=229.50, $p < 0.001$, rrb = 0.58). In terms of bipolar scores, the OCD group (M=2) scored significantly higher than the control group (M=1) (U=357, p=0.014, rrb = 0.34). Finally, a significant difference was also observed in the OCD symptom scores, with the OCD group (M=16) reporting higher OCD scores compared to the control group (M= 0) (U= 0, $p< 0.001$, rrb = 1.00).

The Spearman Correlation Test was employed to investigate whether a significant relationship exists between bipolar prodrome symptoms and OCD scores. First, the relationship between OCD scores and bipolar prodrome symptom scores was analyzed for all participants, followed by an evaluation of data from only the OCD patients. The analysis conducted to determine the relationship between bipolar prodrome symptom scores and OCD symptom scores for the entire sample revealed a statistically significant correlation between the two variables (Table 3). First, a strong positive correlation was observed between the bipolar prodrome symptom severity subscale and the frequency subscale (r_s (64) = .89, $p < .001$). A moderate positive correlation was found between the severity subscale and OCD symptom scores (r_s (64) = .58, $p < .001$). Also, a moderate positive correlation was identified between the frequency subscale and OCD symptom scores (r_s (64) = .53, $p < .001$).

When analyzing the OCD group's scale scores, a statistically significant correlation was found between the severity and frequency subscales, while no significant correlation was observed for the OCD symptom scores (Table 4). A strong positive correlation was identified between the severity and frequency subscales (r_s (29) = .85, $p < .001$). However, no statistically significant correlations were found between OCD symptom scores and the severity subscale (r_s (29) = .34, p = .063), or between OCD symptom scores and the frequency subscale (r_s (29) = .30, p = .104).

After applying the EM correction, a significant positive correlation was observed between OCD symptom scores and both the severity and frequency

Table 3. Spearman correlation test analysis results between OCD symptoms and bipolar prodrome symptoms

		BPSS_Severity	BPSS_Frequency	Y-BOCS
BPSS_Severity	r_s	1		
	p	.		
	N	66		
BPSS_Frequency	r_s	.894	1	
	p	< .001	.	
	N	66	66	
Y-BOCS	r_s	.578	.533	1
	p	< .001	< .001	.
	N	66	66	66

BPSS: Bipolar Prodrome Symptom Scale; Y-BOCS: Yale-Brown Obsessive-Compulsive Scale N: Total number of participants

Table 4. Spearman correlation test analysis results between OCD symptoms and bipolar prodrome symptoms for the OCD group

		BPSS_Severity	BPSS_Frequency	Y-BOCS
BPSS_Severity	r_s	1		
	p	.		
	n	31		
BPSS_Frequency	r_s	.852	1	
	p	< .001	.	
	n	31	31	
Y-BOCS	r_s	.338	.298	1
	p	.063	.104	.
	n	31	31	31

BPSS: Bipolar Prodrome Symptom Scale; Y-BOCS: Yale-Brown Obsessive-Compulsive Scale n: Number of participants in the OCD group

subscales (Table 5). Consistent with the results obtained from the general sample, a moderate to strong positive correlation was found between OCD symptom scores and the severity subscale (rEM = .52). A similar moderately strong positive correlation was found between the frequency subscale and OCD symptom scores (rEM = .53).

DISCUSSION

Based on the findings of this study, firstly, individuals diagnosed with OCD exhibit significantly higher levels of bipolar prodrome symptoms, both in terms of severity and frequency, compared to control group. These findings support the hypothesis that individuals with OCD demonstrate significantly higher bipolar prodrome symptoms than healthy controls. This finding aligns with previous studies in the literature exploring the connection between OCD and BD prodrome symptoms (15,28). A prior study found that individuals diagnosed with OCD are at an increased risk of developing BD later on, a risk that remains even after controlling for the use of SSRIs (1). The results of the present study support this finding. This suggests that bipolar prodrome symptoms may be one of the primary risk factors associated with an OCD diagnosis. Despite the literature search, no studies were found that compare bipolar prodrome symptoms between psychiatrically healthy individuals and those diagnosed with OCD.

Secondly, the findings support the hypothesis of a significant positive correlation between OCD scores and bipolar prodrome symptom scores. As OCD symptoms increase, bipolar prodrome symptoms also tend to increase. This suggests that as the prognosis of an individual with OCD worsens the risk of developing BD may also increase. This finding is consistent with the results of Du and colleagues (15). In their study, they identified an atypical BD group, including individuals with anxiety disorder symptoms, such as OCD, who were treated with mood stabilizers. These individuals exhibited more severe OCD symptoms compared to those in the anxiety group (15). However, it should be noted that, in the total sample, a significant positive correlation was observed between OCD symptom severity and both the severity and frequency subscales of the BPSS. However, when analyzing the OCD group separately, these correlations did not reach statistical significance. This discrepancy may indicate that the associations found in the total sample may be primarily driven by between-group differences, rather than reflecting true within-group variability. To further explore this issue, EM algorithm was applied to estimate missing data in the control group's BPSS scores. After this correction, moderate-to-strong correlations between OCD symptoms and BPSS subscales were again observed, consistent with the original total-sample findings. However, it is important to note that the EM method may not resolve the core interpretive issue raised by the lack of significant

Table 5. Corrected correlation results between OCD symptoms and bipolar prodromal symptoms for the OCD group

		BPSS_Severity	BPSS_Frequency	Y-BOCS
BPSS_Severity	r_{EM}	1		
	p	.		
	n	31		
BPSS_Frequency	r_{EM}	.852	1	
	p	< .001	.	
	n	31	31	
Y-BOCS	r_{EM}	.338	.298	1
	p	.063	.104	.
	n	31	31	31

BPSS: Bipolar Prodrome Symptom Scale; Y-BOCS: Yale-Brown Obsessive-Compulsive Scale n: Number of participants in the OCD group

correlations in the OCD-only group. Rather, it serves to illustrate the overall pattern when missing data are statistically accounted for. Thus, the current findings should be interpreted with caution.

The relationship between OCD symptoms and bipolar prodrome symptoms identified in the present study supports the hypothesis proposed by Amerio et al. (4), suggesting that OCD may serve as an underlying factor for bipolar disorder. The significant findings of this study, which investigates the relationship between OCD and bipolar disorder, suggest a potential clinical overlap between the two conditions, thereby challenging the conceptualization of OCD and BD as entirely distinct and diagnostically independent entities. This result highlights the necessity for additional research in this area.

To our knowledge, this is one of the first studies to examine OCD and bipolar prodrome symptoms within a specific age group. The selection of the 18-25 age range is critical, as this age group represents the period when both bipolar prodrome symptoms are commonly observed and the bipolar disorder diagnosis is frequently made (17, 29, 30). Thus, one of the key contributions of this study is evaluating the risk of developing bipolar disorder before diagnosis in individuals with OCD within this age group. An additional important reason for evaluating the potential risk of bipolar disorder during this period is that previous studies have shown that bipolar disorder emerging before adulthood tends to follow a more severe course (31).

Based on the literature review conducted in the present study, no studies investigating the relationship between BD and OCD have included a control group. The inclusion of a healthy control group in this study constitutes one of its strengths. Furthermore, no studies directly investigating bipolar prodrome symptoms in individuals with OCD have been identified in the literature. Previous research has suggested that OCD may predispose individuals to BD, and that OCD symptoms could represent a risk factor for the development of BD (7, 14). However, there is limited literature available regarding the findings of the present study. Thus, it is anticipated that the results of this study will offer significant contributions to the current body of knowledge. Additionally, as there is limited research on individuals with a primary diagnosis of OCD (9), this study serves to address the knowledge gap in this area.

The prevention, early diagnosis, and appropriate treatment of BD are among the primary clinical objectives. The studies reviewed above, as well as the present research, suggest that OCD may serve as a significant risk factor for BD, with the possibility of similar or distinct prodrome symptoms emerging in BD. A key implication of these findings is that early detection of potential BD patients may be feasible with targeted clinical attention. Therefore, it would be beneficial for clinicians to monitor bipolar prodrome symptoms in individuals with OCD aged 18-25. Based on the fact that the diagnosis cannot be made according to the scale assessment, it is important for the clinician to make a BPSS scale assessment in late adult patients diagnosed with OCD and to consider making a diagnostic evaluation of BPD in patients with high BPSS scores.

However, it is important to acknowledge that the findings should be interpreted in light of certain limitations. First, the study has a limited sample size. The study was conducted within a limited timeframe at a single center as part of a master's thesis. Given the inclusion criteria, which involved a specific age range and the requirement of having a diagnosis of OCD, the number of participants was limited. Moreover, no new individuals who met the study conditions applied to the center during this period. Also, the recruitment of participants from a single private clinical setting may have introduced selection bias. It is likely that the participants included in this study differ from the broader clinical population in terms of treatment adherence and help-seeking behaviors, possibly reflecting higher levels of treatment engagement or distinct socioeconomic characteristics. Furthermore, as the data were collected exclusively from a private psychiatric clinic, the study represents a single-center, non-random sample, which further limits the generalizability of the findings. Patient populations in private clinical settings may systematically differ from those in public healthcare services with regard to socioeconomic status, insurance coverage, and

the severity or comorbidity of psychiatric conditions. Therefore, caution is warranted when attempting to generalize these results to more diverse or representative clinical populationsSecond, previous studies have shown that alcohol and substance use (32), and certain medications used in the treatment of OCD (33) may increase the risk of BD. However, this information was not collected from participants and was not included in the analysis. The direct effects of these medications on symptom presentation, as well as their potential impact on participants' responses, were not fully controlled. Although attempts were made to adjust for some confounding variables in the analyses, the complexity and heterogeneity of medication use pose challenges to achieving complete control in this regard. Although medication use is present in the patient group, it should be considered that, during the evaluation, both clinical examination and psychometric assessments indicate that there are no additional psychiatric comorbidities beyond OCD.

Third, this study only included treated OCD patients. Prodrome BD symptoms in untreated OCD patients remain unknown. Also, a key limitation of this study is the lack of systematic assessment regarding the clinical state (active vs. remission) of OCD participants. Given the symptom overlap between OCD symptoms and bipolar prodrome features (e.g., irritability, mood lability), this restricts the interpretability of the elevated BPSS scores in the OCD group. Additionally, the absence of psychiatric disorders in the control group was determined through self-report and confirmed by low scores on both clinician-administered and self-report measures used in the study (e.g., HDRS, YMRS, BPSS). However, no structured diagnostic interview (e.g., SCID) was conducted. This reliance on subjective reporting and scale thresholds may limit the diagnostic precision and raises the possibility that subclinical or undetected psychopathology could have been present in the control sample. prodromeAnother limitation of the study is that although elevated BPSS scores in the OCD group may suggest the presence of prodrome features associated with BD, it is important to acknowledge that several BPSS items (e.g., mood lability, irritability) overlap with anxiety-related and OCD symptomatology. Moreover, as BPSS is a self-report measure, the findings may be influenced by response bias, which limits the interpretability and reliability of the results. Lastly, due to the study's methodology and its cross-sectional design, causal relationships cannot be established. Consequently, the directionality or temporal progression of the association between OCD symptoms and bipolar prodrome symptoms remains unclear. Therefore, it is uncertain whether OCD patients exhibiting higher bipolar prodrome symptoms will eventually develop a diagnosis of bipolar disorder. prodromeReplicating a similar study across multiple centers with a larger sample size would be beneficial for enhancing the reliability and validity of the findings. Moreover, supporting the study's results with a follow-up investigation would strengthen its conclusions. In order to elucidate the nature of the relationship between OCD and BD, particularly with regard to potential overlapping prodrome symptoms, future research should prioritize longitudinal studies, investigate shared biological mechanisms, incorporate family-based research designs, and assess treatment outcomes across these conditions. Longitudinal studies are therefore necessary to better understand the dynamics and potential causal pathways underlying these associations. Moreover, future studies should incorporate standardized assessments of clinical status (e.g., remission vs. active phase) in patients with OCD at the time of evaluation. Employing validated clinician-rated tools or structured interviews to determine symptom severity would allow for more accurate interpretation of overlapping features between OCD and bipolar prodrome symptoms. Also, stratifying the sample based on clinical status could help clarify whether elevated BPSS scores are more closely linked to active OCD symptomatology or represent distinct risk indicators for bipolar disorder.prodrome Furthermore, individuals with early-onset OCD may have an increased risk of developing BD, which could require additional attention. In addition, especially in clinical practice, it is recommended that individuals diagnosed with OCD in this age group should be questioned comprehensively about their family history, appropriate scales should be used, and they should be examined for bipolar disorder both during the current and follow-up examination.

This study is one of the first studies to investigate

prodrome symptoms of BD in patients with OCD in the literature. Findings from this study point to the fact that individuals with OCD in the 18-25 age group show higher bipolar prodrome symptoms compared to psychiatrically healthy individuals in the same age group, and that as OCD symptoms increase, bipolar prodrome symptoms also increase. In conclusion, the above discussion points to a potential relationship between OCD and bipolar disorder. Clinicians should assess individuals diagnosed with OCD in this age group for the risk of BD.

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*This study was produced by Mine Ozdem from her master's thesis titled "Examining Prodromal Symptoms of Bipolar Disorder in Young Adult Patients with Obsessive Compulsive Disorder" completed at Antalya Bilim University, Institute of Graduate Studies, Department of Clinical Psychology."

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Unraveling the pivotal role of autistic traits in misophonia: A preliminary investigation of the interrelationship between misophonia and sensory sensitivity

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SUMMARY

Objective: A burgeoning body of evidence suggests a higher prevalence of autistic traits among individuals with misophonia. This study aimed to examine the comorbid psychiatric diagnoses and autistic traits along with associations between sensory profiles and internalizing symptoms in a clinical sample of adolescents with misophonia, while also comparing them to a control group.

Method: Female adolescents with misophonia (n = 22) and controls (n = 22) aged 14-18 years participated in this study. Psychiatric evaluations were conducted with semi-structured interviews. The diagnosis of misophonia was established both clinically and through the use of the Amsterdam Misophonia Scale Revised. Autistic traits were assessed by the Youth Self Report. The Revised Children's Anxiety and Depression Scale-Child Version and the Adolescent/Adult Sensory Profile were administered.

Results: The misophonia group exhibited a high prevalence of psychiatric diagnoses, particularly obsessive-compulsive disorder (OCD) and anxiety disorders. Adolescents with misophonia had a significantly higher level of internalizing symptoms, autistic traits, and sensory sensitivities ($p<0.001$, $r=0.58$; $p<0.01$, $d=1.02$; and $p<0.001$, $r=0.58$, respectively). Autistic traits had a mediating role in the relationship between misophonia and sensory sensitivity.

Discussion: These findings suggest that evaluating autistic traits may offer valuable insights into understanding and managing misophonia in female adolescents, opening up avenues for the development of targeted interventions aimed at mitigating the impact of misophonia-related sensory sensitivity outcomes.

Key Words: Misophonia, autistic traits, sensory sensitivity, female adolescent

INTRODUCTION

Misophonia, defined as "decreased sound tolerance" (1), is characterized by intense emotional reactions like anger, anxiety, or disgust to and avoidance behavior from special sounds such as oral sounds (e.g., chewing, slurping, sipping and smacking), nasal sounds (e.g., heavy breathing and sniffling) and some other sounds (e.g., pen clicking, clock ticking, finger tapping (2,3). Although it has been stated that misophonia should be considered as a psychiatric disorder (4), it has not been defined in diagnostic classification systems such as DSM-5 (Diagnostic Manuel of Mental Disorders-5 and ICD-10 (International Classification of Disease-10) (5,6).

Although misophonia has unique clinical characteristics with an underlying neurophysiological mechanism, it has a particularly strong association with psychiatric disorders (7). It has been reported that approximately half of the individuals with misophonia has accompanying anxiety disorder (8), obsessive-compulsive disorder (OCD) (4,9–11) and major depressive disorder (MDD) (7,12,13).

The relationship between misophonia and autism

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spectrum disorder (ASD) like traits has recently been addressed in a few studies (14,15). Elevated autistic traits have been reported in both children and adults with misophonia (15). Similarly, a recent study has reported a positive correlation between the severity of misophonia and autistic traits (14), while contradictory results were identified that ASD traits had no significant relation to the severity of the misophonia symptoms (16).

Lately, another focus on the psychiatric research field of misophonia is the possible association with general sensory sensitivities, and an obvious finding is that children with misophonia showed greater sensory hypersensitivity not only in the auditory domain but also more widely across multiple senses (12,15). In this regard, the profound association between ASD and misophonia has prompted researchers to explore the possibility of misophonia as a sensory manifestation of ASD. However, the sensory sensitivity commonly observed in ASD (touch and smell) usually diverges from the sensory profile identified in individuals with misophonia (sound) (15). Therefore, the precise nature of the association between elevated ASD characteristics and increased sensory sensitivity in individuals with misophonia have not yet been conclusively established.

Although there has been a recent rise in interest regarding misophonia, few studies have focused on concurrent psychiatric symptoms and sensory profile in adolescent aged group (10,15). As such, the current study aims to focus on the gap by investigating the co-occurrence of internalizing symptoms (anxiety, OCD and depressive symptoms), sensory profiles and autistic traits among adolescents with misophonia in a comparison with a control group without misophonia. The first aim of this study was to determine the accompanying psychiatric disorders. The second aim was to investigate specific psychological profiles associated with misophonia, including autistic-like traits, sensory profiles, and internalizing symptoms. The third aim was to clarify the pivotal role of autistic traits in the relationship between misophonia and sensory sensitivity.

Based on the aforementioned aims, we hypothesized that (I) adolescents with misophonia would exhibit higher rates of comorbid psychiatric disorders, particularly obsessive-compulsive disorder and anxiety, compared to controls; (II) individuals with misophonia would demonstrate significantly elevated levels of autistic traits, internalizing symptoms, and sensory sensitivities; and (III) autistic traits would mediate the relationship between misophonia and sensory sensitivity. By addressing these hypotheses, the current study seeks to contribute to the growing body of literature by providing a more comprehensive understanding of the psychiatric and sensory characteristics of adolescents with misophonia. In doing so, the findings may inform future diagnostic considerations and intervention strategies, and underscore the importance of recognizing misophonia as a distinct clinical profile, especially in adolescent female populations.

METHODS

Participants and procedure

This study was conducted at Sami Ulus Training and Research Hospital, department of child and adolescent psychiatry in Türkiye from July to December 2021. The sample consisted of 14-18-year-old adolescent females, newly diagnosed with misophonia (n=22; mean age= 15.36 years, SD=1.32), and age-matched controls (n=22; mean age= 15.95 years, SD=0.84) without misophonia.

The misophonia group comprised clinical cases who applied to the child and adolescent psychiatry outpatient clinic and were newly diagnosed with misophonia by a board-certified child and adolescent psychiatrist. Participants were recruited consecutively over a defined period using purposive sampling, ensuring that all individuals who met the inclusion criteria and consented to participate were included in the study.

The control group was selected from among the patients who applied to the pediatric outpatient clinics for minor acute illnesses such as common cold and coughs without having any psychiatric disorders. The healthy control group was matched for sex to control for potential sex-related differences and ensure homogeneity in sex distribution across groups.

Inclusion criteria for both groups were: being female, aged between 14 and 18 years, and having sufficient cognitive and language abilities to complete the assessments. For the misophonia group, a new diagnosis of misophonia confirmed by a child and adolescent psychiatrist was required. Exclusion criteria for both groups included the presence of any neurological or chronic medical conditions, uncorrected visual or hearing impairments, and any current or past psychiatric disorders in the control group.

The research protocol was approved by the Ethics Committee of Sami Ulus Hospital (Ethics approval reference number: E-21/06-195). Written informed consent was obtained from all participants and their parents.

First of all, sociodemographic characteristics of the participants were evaluated with a form prepared by the researchers. Next, psychiatric assessments were conducted by certificated child and adolescent psychiatrists who are certified in the application of Schedule for Affective Disorders Schizophrenia for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime Version (K-SADS-PL). The diagnosis of misophonia was established through clinical assessment by a child and adolescent psychiatrist, supported by scores on the Amsterdam Misophonia Scale Revised (AMISOS-R), which was used as a categorical measure to confirm the presence of misophonia. This combined approach ensured that case identification was based on both a structured clinical assessment and the use of the AMISOS-R as a standardized diagnostic instrument. Finally, the following questionnaires were administered respectively for the evaluation of anxiety, depressive symptoms and autistic traits: Revised Children's Anxiety and Depression Scale Child Version (RCADS-CV), Youth Self Report (YSR), and Adolescent/Adult Sensory Profile (AASP). Eligible participants completed the study measures during a single session, which was conducted concurrently with their psychiatric assessments.

Measures

Sociodemographic characteristics of the groups were examined using a semi-structured interview form, including age, disease history and family characteristics. The Hollingshead-Redlich Scale (HRS) was used to determine socioeconomic status (SES), divided into three categories: low (HRS $\leq$22), medium (HRS 23-44), and high (HRS $\geq$ 45) levels of SES (17).

K-SADS-PL-DSM-5, a semi-structured interview, is widely used for diagnosing child psychiatric disorders evaluating psychiatric symptoms and ending with diagnostic supplements (18). The K-SADS-PL-DSM-5 Turkish version has been found to be valid and reliable (19).

AMISOS-R is a self-reporting instrument that measures the presence and severity of symptoms experienced in response to particular auditory stimuli (4). The AMISOS-R was determined to be a valid and reliable instrument for evaluating misophonia in a Turkish adolescent sample, exhibiting a Cronbach's α of .92 and a test-retest reliability score of .89 (20). Following an initial inquiry regarding which sounds participants are sensitive to and the emotional responses these sounds elicit, a 10-item rating scale is administered. Each item is scored on a scale from 0 to 4, yielding a maximum possible total score of 40. Based on the total score, the severity of misophonia is categorized into four levels: normal and subclinical misophonia, mild misophonia, moderate to severe misophonia, and severe to extreme misophonia (20).

RCADS-CV was developed to screen for anxiety disorders, depression, and obsessive-compulsive symptoms in children and adolescents. This self-report questionnaire consists of forty-seven items and six subscales (generalized anxiety disorder, separation anxiety disorder, panic disorder, obsessive-compulsive disorder, social anxiety disorder, and major depressive disorder), and two comprehensive subscales (Total Internalizing and Total Anxiety) (21). Elevated scores correlate with heightened levels of symptoms. The validity and reliability of the Turkish version were conducted, inter-scale reliability was strong/excellent with a Cronbach's α of .95 and subscale coefficients ranging from .75 to .86, indicating strong internal consistency (22).

YSR, a self-report questionnaire, is designed to obtain 11-18 years olds' self-ratings of psychiatric problems (23). The YSR includes 112 emotional and behavioral problems based on the preceding 6 months. High scores indicate high levels of problems. A Turkish adaptation study was found to be valid and reliable (for total score, test-retest reliability= .82 and Cronbach's alpha=.89) (24). This checklist, similar to the Child Behavior Check List, is also used to define autistic traits (AT)-sum of the Withdrawn/Depressed, Social Problems, and Thought Problems subscales T-scores-, scoring above 195 is considered as a positive AT profile (25). This threshold was established and validated in prior research employing the ASEBA framework, demonstrating its efficacy in identifying clinically significant autistic-like behaviors (26).

AASP queries and evaluates adolescents' and adults' sensory processing abilities in their daily lives based on Dunn's sensory processing model. The responses are evaluated in four quadrants: low registration, sensory sensitivity, sensory avoiding, and sensory seeking (27). The Turkish version of the AASP questionnaire showed high internal consistency and test–retest reliability (r=.0.66–0.82 and r=0.67–0.82, respectively) (28).

Statistical Analysis

A priori analysis was conducted using G*Power 3.1 to determine the minimum sample size required to detect a large effect size (Cohen's d = 0.8) with a power of 0.80 and an alpha level of 0.05 for between-group comparisons (independent samples t-tests) (29). The analysis indicated that a total sample size of 42 participants (21 per group) would be sufficient to detect statistically significant differences (30,31).

IBM SPSS (Statistical Program for Social Sciences) 22.0 was used for statistical analyses of the sociodemographic and clinical characteristics of the groups. Prior to the analyses, the Shapiro-Wilk test was used to determine the normality of the data distribution. Group comparisons for continuous variables were conducted using the Independent samples t-test for the normally distributed variables, while the Mann-Whitney U test was used for non-normal distributions. For categorical comparisons, Fisher's exact test was performed. Spearman correlations were used to determine the relationships between scale scores. To determine the mediating effect of the autistic traits, multiple regression analyses were conducted to examine the relationship between misophonia (predictor) and sensory sensitivity scores (outcome) in the whole sample. All statistical tests were two-tailed with a threshold for significance of $\alpha = .05$.

RESULTS

Sociodemographic and clinical characteristics of the groups

Both groups were found to be similar in terms of age, parental age, education level, and family characteristics (p> .05) (see Table 1).

Among the controls, one of the siblings had ADHD, and in the misophonia group, two parents had anxiety, two parents had OCD diagnoses, and one sibling had anxiety (Table 1). Thirteen (59%) out of 22 females with misophonia had psychiatric disorders, while the female participants in the control group did not receive any psychiatric diagnosis, although three of them had subthreshold anxiety disorders. Among the misophonia group, three participants (13.6%) had pure anxiety disorders, while an equivalent number of female participants (13.6%) had pure OCD. Additionally, four of them (18.1%) presented with comorbid diagnoses of OCD and anxiety, and two (9%) had a comorbidity of anxiety and depression. Furthermore, one female participant (4.5%) had an eating disorder.

Internalizing symptoms, sensory profiles, and autistic traits of the groups

Female participants with misophonia had significantly higher scores of depression, anxiety, and obsessive-compulsive symptoms and higher sensory processing profile scores in all four quadrants of AASP compared with controls (Table 2). The misophonia group scored significantly higher, especially in the domains of sensory sensitivity and sensory avoiding (p<.001 and p= .001, respectively).

Table 1. Sociodemographic characteristics of groups

Sociodemographic Variables	Misophonia (n=22) Mean (SD)/ Mdn (IQR)/n (%)	Control (n=22) Mean (SD)/ Mdn (IQR)/n (%)	*p*
Participants' age (years) [a]	15 (14-17)	16 (15-17)	0.138
Mothers' age (years) [b]	44.25 (5.43)	47.05 (5.93)	0.475
Fathers' age (years) [b]	47 (4.55)	50.91 (5.83)	0.234
Mothers' education level [c], n (%)			
Less than high school	6 (27.3)	2 (9.1)	
High school	8 (36.4)	7 (31.8)	0.196
College degree or higher	8 (36.4)	13 (59.1)	
Fathers' education level [c], n (%)			
Less than high school	3 (16.7)	1 (4.5)	
High school	8 (23.3)	4 (18.2)	0.225
College degree or higher	11 (50)	17 (77.3)	
Family type [c], n (%)			
Nuclear family	21 (95.5)	22 (100)	
Extended family	1 (4.5)	0 (0)	1
SES [c], n (%)			
Low	4 (18.2)	3 (13.6)	
Medium	11 (50)	6 (27.3)	0.217
High	7 (31.8)	13 (59.1)	
Family history of psychiatric disorders [c], n (%)			
None	17 (77.3)	21 (95.5)	
Either parents	4 (18.2)	0	0.009
Siblings	1 (4.5)	1 (4.5)	

Note: Means are shown with standard deviations in parentheses; and medians are shown with inter-quartile range in parantheses. SD: Standard Deviation; Mdn: Median; IQR: Inter-quartile range; SES: socioeconomic status [a] *Mann-Whitney U Test,* [b] *Independent Samples T-Test,* [c] *Fisher's Exact Test*

Comparing the autistic traits between the two groups, after the assumption of normality was confirmed, Student's t test was performed. Female participants in the misophonia group had significantly higher AT scores than controls on the YSR mean (SD)=185.72 (15.96) vs 170.00 (14.76); t (42) =-3.39, p=.002; Cohen's d = 1.02]. From the categorical perspective, more misophonia than control participants had a positive AT profile (12 [54.5%] vs 2 [9.1%]; Fisher's exact test, p=.003).

Associations between internalizing symptoms, autistic traits, and sensory profiles

Based on the our main hypothesis, the associations between total anxiety and total internalizing scores (total anxiety & depression), autistic trait scores, and sensory profile scale scores were investigated. Moderate-to-strong statistically significant correlations were detected between anxiety scores, depressive symptoms, autistic traits and sensory sensivity scores in the whole sample (Table 3).

Mediation analysis for the relationship between misophonia and sensory sensitivity

A One-way ANCOVA was conducted to determine the impact of psychiatric diagnoses on the association between misophonia and sensory sensitivity. Statistically significant effects of the misophonia on sensory sensitivity were found even after controlling for the diagnosis of OCD [F(1, 41)= 18.43,

Table 2. Comparisons of scale scores across the groups

	Misophonia (n=22)	Control (n=22)		
	Mdn (IQR)	Mdn (IQR)	Z/U	*p*
RCADS-CV				
GAD	55 (47.5-62.5)	49 (41-57)	-2.07/154	0.038*
SAD	57 (46.5-67.5)	48 (39-57)	-2.00/157	0.045*
PD	72 (63-81)	46.5 (36-57)	-3.26/103.5	0.001**
OCD	64 (57-71)	50.5 (41.5-59.5)	-3.18/106.5	0.001**
SP	54 (44.5-63.5)	44.5 (35.5-53.5)	-2.31/143.5	0.021*
MDD	73 (61.5-84.5)	41.5 (30-53)	-4.22/62.5	<0.001***
Total Anxiety	65 (55.5-74.5)	47 (39-55)	-3.33/100	0.001**
Total Internalizing	66 (55.5-76.5)	45 (36.5-53.5)	-3.86/77.5	<0.001***
AASP				
Low registration	33 (28-38)	29 (23-35)	-1.89/161.5	0.058
Sensory seeking	42 (38.5-45.5)	44.5 (40.5-48.5)	-1.77 /166.5	0.075
Sensory sensitivity	47 (42.5-51.5)	35 (30.5-39.5)	-3.85/78	<0.001***
Sensory avoiding	44.5 (40.5-48.5)	36.5 (32.5-40.5)	-3.33/100	0.001**

Note: Medians are shown with inter-quartile range in parantheses.
Mdn: Median; IQR: Inter-quartile range; RCADS-CV: Revised children's anxiety and depression scale-child version; GAD: Generalized anxiety disorder; SAD: Separation anxiety disorder; PD: Panic disorder; OCD: Obsessive-compulsive disorder; SP: Social phobia; MDD: Major depressive disorder; AASP: Adolescent/adult sensory profile *Mann-Whitney U Test* *p<0.05, **p<0.01, ***p<0.001

Table 3. Correlation anaylses of scale scores

	RCADS-CV Internalizing	YSR-AT	AASP Low registration	AASP Sensory seeking	AASP Sensory sensitivity	AASP Sensory avoiding
RCADS-CV Anxiety	0.974***	0.609***	0.502**	-0.022	0.632***	0.673***
RCADS-CV Internalizing		0.646***	0.523***	-0.031	0.654***	0.685***
YSR-AT			0.479**	-0.048	0.581***	0.610***
AASP/Low registration				0.207	0.551***	0.372*
AASP/Sensory seeking					-0.136	-0.212
AASP/Sensory sensitivity						0.786***

RCADS-CV: Revised childrens anxiety and depression scale child version; YSR: Youth Self Report; AT: Autistic trait; AASP: Adolescent/adult sensory profile
Spearman Correlation Test *p<0.05, **p<0.01, ***p<0.001

p<.001)], anxiety [F(1, 41)= 15.50, p<.001)], and depression [F(1, 41)= 25.67, p<.001)]. To further determine the interrelationship between misophonia, autistic traits and sensory sensitivity regression analysis was carried out. A model was developed based on the hypothesis that autistic traits could mediate the relationship between misophonia and sensory sensitivity. Finally, the significant correlations of both YSR-AT score (autistic traits) and group with AASP/Sensory Sensivitiy score (r =0.58, p < .001, and r = 0.61, p < .001, respectively) suggested the eventual presence of a partial mediating effect of autistic trait score on the relationship between group and sensory sensitivity score. The mediation analysis showed a significant indirect effect of group on sensory sensitivity score through autistic traits, β= 0.39 (95% bootstrapped); group showed β=0.54, p < .001 for YSR-AT score (Figure 1).

DISCUSSION

In this study, comorbid psychiatric disorders, autistic traits, sensory profiles, and internalizing symptoms in female adolescents with misophonia were investigated and compared with age-matched controls. Additionally, the interrelationships between autistic traits, sensory sensitivities, and misophonia were identified along with the direct and indirect effects. Since a greater prevalence of misophonia has been reported in females (32), and the vast majority of cases with misophonia presented in the previous studies (12,13) are female gender, our sample consisted entirely of female adolecents. It is also possible that gender-related discrepancies in seeking professional help may skew reported prevalence rates (33). In other words, misophonia itself may not exhibit gender-related patterns, potentially implicating sampling bias. Nevertheless, because our sample includes clinical data, it is important to examine the psychiatric correlates in females with misophonia. Nevertheless, it is important to note that our research findings. Naturally, these results are ultimately applicable to the female adolescent clinical group.

Initially, it was observed that approximately half of adolescent females with misophonia also presented with either comorbid anxiety, OCD, or both. According to our research findings, approximately one-third of them had OCD, and one-fifth had an anxiety disorder, which is consistent with recent studies (34,35). Based on the substantial comorbidity between misophonia and these disorders (4,8–10), previous announcements have suggested that individuals who exhibit misophonia as a major complaint should be assessed for other psychiatric

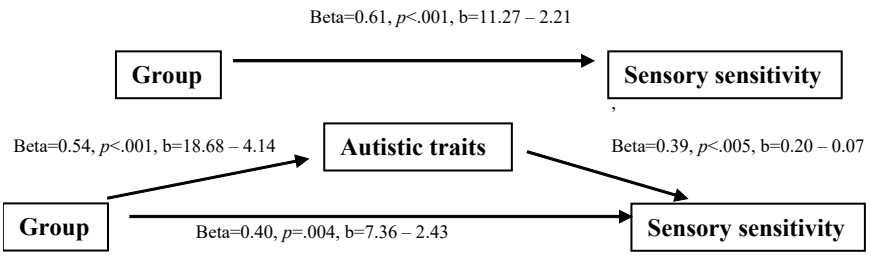

Figure 1. Mediation analysis results

disorders, specifically OCD and anxiety disorder (36). Additionally, it is well established that misophonia shares phenomenological similarities with OCD and anxiety disorders (4,9,13). However, misophonia falls short of meeting the complete diagnostic criteria for any of these specific disorders (37), and vice versa, these diagnoses do not fully encompass all of the symptoms of misophonia (4). Consequently, this finding could support the arguments that misophonia should be considered as a distinct diagnosis with its own unique clinical characteristics (7,38).

Recent research investigations have demonstrated that individuals with misophonia exhibit heightened levels of autistic traits (15), and a strong positive association has been observed between the severity of misophonia symptoms and the presence of these autistic traits (14). As expected, higher YSR-AT scores indicating increased autistic traits in the misophonia group than controls supported these findings. This observation is also consistent with previous research showing that individuals with misophonia often present with elevated levels of autistic traits, including sensory sensitivities, rigid thinking patterns, and difficulties with social communication (16,39). Such studies have highlighted overlapping features between misophonia and ASD, suggesting shared underlying neurodevelopmental mechanisms. These parallels reinforce the notion that autistic traits may play a significant role in the clinical profile of individuals with misophonia. On the other hand, there is also evidence suggesting no significant association between the ASD and misophonia. For instance, a study examining children and adolescents found that ASD symptoms were not elevated in children with misophonia, and no correlation between misophonia symptoms and ASD traits was observed. In fact, ASD symptoms were significantly lower in children with misophonia compared to those with anxiety disorders (34). Similarly, research focusing on adolescent outpatients reported an inverse correlation between misophonia and autistic traits, indicating that higher levels of misophonia symptoms were associated with lower levels of autistic traits (40). These findings highlight the complexity of the relationship between misophonia and autistic traits, indicating that while some individuals may exhibit overlapping features, misophonia does not universally co-occur with ASD.

According to the current results, female adolescents with misophonia also demonstrated greater sensory sensitivity using AASP, consistent with the prior investigations (2). The strong correlations observed between misophonia and general sensitivities suggest a potential link between selective sound sensitivities and increased prevalence of other forms of sensory hypersensitivity (12). Another related issue is whether misophonia is different from sensory over-responsivity (SOR), which is a clinical condition seen in childhood and is associated with ASD, and also is a part of the diagnostic criteria for ASD in the latest DSM (5). SOR is characterized by intense distress (e.g., irritability or anger outbursts) by sensory stimulation, such as a particular auditory stimuli (e.g., sirens) (41). Since the trigger stimuli associated with SOR are not the same as those associated with misophonia (e.g., chewing, breathing), it can be argued that SOR and misophonia are a discrete entity (42). Additionally, misophonia and ASD should not be regarded as synonymous, although in this study, it was observed that approximately half of the adolescents with misophonia exhibited characteristics resembling those found in ASD.

Studies have indicated significant relationships between all four quadrants of the sensory profile (28). Here, we found that females with misophonia had significantly higher sensory sensitivity, sensory avoiding, and low registration scores. Regarding the current correlations between sensory profiles of all participants, we found moderate-to-large positive relationships, except for the sensory seeking domain. The lack of significant differences can be interpreted as suggesting that sensory seeking is not consistently stable and uniform, particularly during later developmental stages that correspond to the age range of the group included in our study (43).

Mediation analysis revealed that autistic symptoms acted as a mediator in the relationship between misophonia and sensory sensitivity. This evidence holds potential implications for interventions as it unveils an underlying mechanism that indirectly influences the outcomes associated with misopho-

nia. As such, it may be beneficial to target sensory sensitivities to evaluate autistic traits before implementing psychiatric interventions. However, due to the small size and cross-sectional nature of the current study, conducting mediation analysis is rendered questionable at best. Therefore, it is evident that these factors should also be considered when interpreting the mediation results, especially in this context.

The emerging evidence on the association between SOR in ASD has spurred theoretical speculation, with one model proposing that ASD contributes to SOR (44). More recently, sensory sensitivity has become part of the diagnostic criteria for ASD (5). In line with these suggestions, our mediation analysis demonstrates the mediator role of autistic traits between misophonia and sensory sensitivity. In light of our findings, defining ASD-related traits may constitute a valuable alternative research emphasis within the realm of misophonia.

This study offers several unique contributions to the existing literature on misophonia. Unlike most previous studies, which have primarily focused on adult populations or lacked well-defined diagnostic procedures, the current research specifically targeted clinically diagnosed female adolescents, using both clinical evaluation and psychiatric scales. By incorporating a control group matched for age and sex, this study also enabled a more rigorous comparison of psychiatric comorbidities, sensory profiles, and autistic traits. Furthermore, the inclusion of mediation analysis allowed for an exploration of the underlying mechanisms linking misophonia, sensory sensitivity, and autistic traits—an area that remains understudied. These methodological strengths underscore the value of this study in advancing the understanding of misophonia as a distinct clinical entity with unique neurodevelopmental features, particularly in female adolescents.

There exist several limitations that are considered as such. First, the cross-sectional design did not allow for causal relationships to be established between misophonia and psychiatric comorbidities. Therefore, it is difficult to ascertain whether misophonia is a risk factor for the development of psychiatric comorbidities or whether the presence of comorbid psychiatric conditions exacerbates misophonia symptoms. Second, the study relied on self-reported measures of psychiatric symptoms and sensory profiles, which may be subject to response bias and social desirability effects. Additionally, because the severity of misophonia was not assessed, it was not possible to examine the relationship between psychiatric symptoms and misophonia severity. Most notably, the relatively small sample size restricts the statistical power and may limit the robustness of the observed relationships. Additionally, the sample consisted exclusively of female adolescents, which may reduce the generalizability of the findings to male populations or to broader clinical and community samples.

Given the preliminary nature of the present study, future research should aim to replicate and expand upon these findings in larger, more diverse samples, including both female and male participants, to enhance generalizability. Longitudinal designs would be particularly valuable for examining the temporal dynamics and potential causal relationships between misophonia, autistic traits, and sensory sensitivities. Additionally, the inclusion of objective assessments of misophonia severity and multi-informant reporting (e.g., parent or clinician ratings) could help reduce self-report bias and strengthen the validity of observed associations. Neurobiological or neuroimaging studies may also contribute to clarifying the shared and distinct mechanisms underlying misophonia and related neurodevelopmental conditions such as ASD. Moreover, experimental studies exploring targeted interventions that address sensory processing difficulties and autistic traits may provide further insight into effective treatment approaches tailored to individuals with misophonia.

In conclusion, the present study identified several noteworthy findings concerning female adolescents with misophonia. Notably, a substantial proportion of participants exhibited comorbid psychiatric disorders, particularly obsessive-compulsive disorder and anxiety, aligning with prior research. Furthermore, individuals with misophonia demonstrated significantly higher levels of autistic traits and sensory sensitivities relative to age-matched controls. Lastly, the current findings indicated that autistic traits may function as an intermediary fac-

tor linking misophonia to sensory sensitivity, suggesting a potentially shared neurodevelopmental mechanism. Collectively, these results offer a more refined understanding of the clinical profile of misophonia and lend support to its conceptualization as a distinct diagnostic entity, rather than a mere manifestation of other conditions such as OCD or ASD. These findings have important implications for both clinical practice and future research because they shed light on the potential mechanisms underlying misophonia and open up avenues for developing targeted interventions that address autistic traits to mitigate the impact of misophonia-related sensory sensitivity.

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Ethical approval and consent to participate: This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of Sami Ulus Hospital (Ethics approval reference number: E-21/06-195). Informed consent to participate prior to psychiatric assessment was a prerequisite for study inclusion. Confidentiality was assures and participants were able to withdraw consent or discontinue participation at any time.

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The impact of the COVID-19 pandemic on mood symptoms in inpatient mood disorder patients and associated factors

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SUMMARY

Objective: The COVID-19 pandemic has adversely impacted mental health, with mood disorder patients at increased risk due to stress, isolation, and healthcare disruptions. While studies highlight rising depression and anxiety in these populations, comparisons of pre- and post-pandemic symptoms remain limited. This study examines the late-phase mental health effects of the pandemic on mood disorder patients and associated factors.

Method: In our study, 67 patients diagnosed with mood disorders who were hospitalized between March 2019 and March 2020 were evaluated in the ninth month of the pandemic. Data were collected through face-to-face or online interviews, and clinical information such as sociodemographic characteristics, illness severity, and fear of COVID-19 was recorded.

Results: Participants were 65.7% female and 34.3% male, with a mean age of 45.8±19 years. Of the patients, 32.9% had completed higher education, and 56.2% were unemployed. Interviews were face-to-face (44.8%) or telepsychiatric (53.7%). The mean pre-pandemic hospitalization duration was 41.6±24.8 days. No significant differences were found in HAM-D scores pre- and post-pandemic for major depressive or bipolar depressive patients. However, 55.2% had HAM-D ≥8 during the pandemic. Patients with a history of COVID-19 infection showed significantly higher depression severity.

Discussion: By the ninth pandemic month, over half of mood disorder patients had depressive symptoms. COVID-19 infection, lack of knowledge, and unmet psychological support needs were linked to depression. Restricted access to mental health services further increased depression rates. These findings highlight the psychosocial and biological impacts of the pandemic on mood disorders.

Key Words: COVID-19, Mood Disorders, Mental Health, Pandemic, Depression Severity

INTRODUCTION

Emerged in March 2020, the coronavirus infection (COVID-19) continues to affect various segments of societies in different countries. It can be estimated that the negative effects of the pandemic on the physical ad mental health of the people in vulnerable segments of society are more pronounced. People with chronic mental disorders are among these vulnerable groups (1). Factors that make patients with schizophrenia and bipolar disorder more susceptible to the negative effects of COVID-19 infection include being more vulnerable to stress, not being able to go to follow-up visits regularly, and the fact that risk factors related to diseases such as obesity and diabetes are more common in these groups (1,2). It is estimated that isolation and loneliness caused by protective measures such as social distancing rules may lead to an increase in the symptoms of these patients (3). It has been reported that patients with mood disorders have a higher awareness of environmental changes compared to patients with schizophrenia spectrum disorder. Therefore, they may experience stress symptoms associated with COVID-19 at a higher rate (4).

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It is suggested that patients with mood disorders and anxiety disorders have a risk of worsening symptoms during the pandemic period. It is thought that they will experience the fear of getting sick more and adapt to lifestyle changes related to quarantine and isolation more difficult (5). In studies conducted during the pandemic period, it was reported that patients with bipolar disorder and major depressive disorder experienced more anxiety, depression symptoms and stress than those without mood disorders (6). Again, in a study conducted in the Netherlands in the first 6 months of the pandemic, in which patients with schizophrenia and mood disorders were evaluated over the internet, it was shown that mood disorder patients were more negatively affected by the pandemic and restrictive measures than schizophrenia patients (7).

Studies investigating the impact of the COVID-19 pandemic on people with chronic mental illnesses are mostly cross-sectional studies, and in a few studies, the level and variety of symptoms of patients before the pandemic started were compared with those during the pandemic period (8,9,10,11,12). In this regard, the number of studies conducted in Turkey is quite low (13). In studies involving patients with mood disorders and schizophrenia conducted in the early period of the pandemic, it was observed that mood symptoms and psychotic symptoms remained stable (10,11). Similarly, it was observed that older adults who were followed up with a diagnosis of major depressive disorder before the pandemic did not have an increase in depressive symptoms in the early period of the pandemic (9). In a study conducted by collecting online data, which included patients who had major depression in the past, it was observed that the increase in symptom severity observed in the early period of the pandemic (April-May 2020) was not different from patients who had not been diagnosed with depression in the past (12). The fact that the severity of depressive symptoms did not increase in the early period in this study was explained by the fact that the study was conducted in a period when the financial and social effects of the pandemic and the disruptions related to access to treatment were not yet evident. In contrast to these findings, in another study conducted in the early period of the pandemic, it was found that patients who reported a diagnosis of mood disorder were in a higher level of psychological distress than patients who reported that they did not have any mental illness, and patients with bipolar disorder reported that they experienced more depressive symptoms and stress than patients with unipolar depression (11).

In the late phase of the COVID-19 pandemic, it can be hypothesised that patients with mood disorders may have adapted to pandemic conditions to some extent, similar to the rest of the population. However, it is expected that they may have encountered additional difficulties due to disruptions in health services, whereas arrangements for control examinations and drug supply are expected to facilitate access to treatment for some patients (14). On the other hand, the pandemic lasting longer than expected, the lack of an effective treatment of the infection, and the fact that different variants continue to emerge cause many people to witness the loss of their relatives and acquaintances and to continue their fears about COVID-19. In addition to all these, psychosocial difficulties such as unemployment, poverty, loss of support due to being away from social networks, loss of routine, uncertainties related to the near and distant future caused by prolonged isolation conditions are estimated to have a negative effect on mental status (15). However, there are no studies in the literature investigating the change in the symptoms of patients with mood disorders in the pre-pandemic period and the effect of factors associated with the change in the later stages of the pandemic (in the second/third wave).

Contributing to understanding the effects of the pandemic in its later stages is important in many ways. Identifying how patients with mood disorders have been affected by the pandemic may help to develop more effective support mechanisms in the face of similar global crises in the future. Moreover, analysing the effects of disruptions in access to treatment and ongoing uncertainties on symptoms of mental illness is critical for the planning of mental health services and the formulation of crisis intervention strategies. In this study, mood disorder patients who were hospitalised in the psychiatric ward in the last year before the onset of the pandemic were evaluated in the second wave of the

pandemic (9-11 months later). It was aimed to investigate how the patients were affected by the pandemic process, to examine the changes in the levels of mood symptoms before and after the pandemic, and to examine the relationships between the severity of mood symptoms during the pandemic period and sociodemographic and clinical characteristics. The hypotheses of the study were determined as follows: The pandemic process has an effect on the severity of depressive symptoms of patients with mood disorders and symptom severity is different in the pre-pandemic period than in the pandemic period; there are differences in sociodemographic and clinical characteristics of patients with mild or higher severity of depressive symptoms (HAM-D ≥8) and patients without depression (HAM-D <8) during the pandemic period; In the evaluation conducted in the second wave of the pandemic, there was a difference in depressive symptom severity between patients diagnosed with major depression and patients diagnosed with bipolar depression; pandemic-related stress factors (COVID-19 infection, quarantine history, psychiatry referral during the pandemic and expectation of psychiatric intervention, etc.) and depressive symptom severity.) and depressive symptom severity were assumed to have a significant relationship.

METHOD

This study is a cross-sectional observational and descriptive study. Approval for the study was obtained from the Hacettepe University Ethics Committee with registration number GO 20/804.

Participants

Information on patients who were hospitalised in the Psychiatry Service of Hacettepe University Faculty of Medicine Adult Hospital between March 2019 and March 2020 and discharged with the diagnoses of bipolar disorder and major depression was accessed from hospital records. The study sample consisted of 67 patients who were not defined any exclusion criteria, could be reached and accepted to participate in the study.

Data Collection

Patients who agreed to participate in the study and to be interviewed face-to-face were evaluated in the outpatient clinic, and patients who were absent at the outpatient clinic control time or who could not come to the hospital for routine evaluation were evaluated by online interview. During the evaluation, written informed consent was obtained from those evaluated in the outpatient clinic, and verbal consent was obtained from those evaluated by online interview and recorded. The application of the scales in the online interview was in the form of the researchers reading the scale items and recording the patients' responses. During the interviews, the research team filled out the patient evaluation form, which included sociodemographic information such as age, gender, marital status, education, occupation, and with whom the patients lived, drug treatments related to mental and physical illnesses, and information about the pandemic period such as whether they had COVID-19 disease and whether they were quarantined. In addition, the Clinical Global Impression Scale (CGI) (16), which is used to evaluate the medication(s) used at discharge from the hospital epicrisis, discharge diagnoses, additional psychiatric diagnoses, discharge dates, length of hospitalisation and severity of disease symptoms during hospital follow-up, Hamilton Depression Rating Scale (HAM-D) (17,18) for patients diagnosed with depression and Young Mania Rating Scale (YMRS) (19,20), which is routinely applied to bipolar disorder patients hospitalised during mania (19,20), were obtained and recorded on the same form.

In the evaluation performed during the study, HAM-D, CGI and COVID-19 Fear Scale (21,22) were given to all patients. Patients who were found to have mania/hypomania symptoms during the interview were given the YMRS. Treatment adherence of the patients was determined from the hospital epicrisis, outpatient clinic notes, medication level follow-up patterns, if any, and clinical interviews and classified as high and medium-low. In addition to the services available and accessible to patients during the pandemic process, health services that patients requested but could not be met, such as being able to make appointments more frequently, being evaluated by online interview, being

Table 1. Clinical Characteristics of the Participants

Clinical Features Related to the Hospitalisation Period Before the Pandemic	N (%)
Diagnosis of Discharge	
Major Depression	39 (58,2)
BAD-Depressive Period	16 (23,9)
BAD-Manic/Hypomanic Period	12 (17,9)
Psychotic symptoms accompanying affective symptoms	28 (41,8)
Psychiatric comorbidity	15 (22,4)
Physical comorbidity	35 (52)
Non-drug treatment modality used during hospitalisation	
TMS	1 (1,5)
ECT	22 (32,8)
Treatments accompanying oral drug therapy at discharge	
Long-acting AP	3 (4,5)
ECT	3 (4,5)
Drug therapy requiring blood level monitoring at discharge	38 (56,7)
Treatment adherence before the pandemic	
High	52 (77,6)
Medium-Low	15 (22,4)
Clinical Characteristics of the Participants during the Pandemic Period	Average±SD
Time between pandemic onset and evaluation	273,5± 17,7
COVID-19 Fear Scale	15,3± 5,3
CGI-Pandemic	7,7 ± 3,4
HAM-D- Pandemic	9,4 ±6,9
	N (%)
HAM-D 8 points and above (clinical depression)	37 (55,2)
The level of knowledge about the pandemic	
High	42 (62,7)
Medium	19 (28,4)
Bad	6 (8,9)
Use of psychiatric services during the pandemic	
Yes	52 (77,6)
No	15 (22,4)
New physical symptom in the pandemic process	
Yes	11 (16,4)
No	56 (83,6)
Current Body Health Perception	
High	35 (52,2)
Medium-Bad	34 (47,8)
Having COVID-19 infection	7 (10,4)
Quarantine due to contact	12 (17,9)
Perception of mental state during the pandemic	
Not Changed	33 (49,3)
Worsened	25 (37,3)
Improved	9 (13,4)
Failure to take medication during the pandemic	18 (26,9)
Failure in drug level monitoring (n=38)	20 (52,6)
Notification of exacerbation of disease symptoms	33 (49,3)
Suicidal thoughts/plans during the pandemic	4 (6)
New mental symptoms emerging during the pandemic	11 (16,7)
Unmet expectation of additional intervention during the pandemic period	23 (34,3)
Smoking-alcohol-substance use	
Smoking	32 (42,8)
Alcohol	10 (14,1)
Substance	4 (6)

SD: Standard Deviation; BAD: Bipolar Affective Disorder; DDD: Mood Regulator

examined by their doctors whom the patients were previously followed up but could not see due to pandemic conditions, were defined as unmet additional intervention expectations.

In the study, patients were firstly divided into diagnostic groups and the scale values of the post-discharge, i.e. pre-pandemic period and post-pandemic period were compared. In addition, the scale scores of the patients in the post-pandemic period were evaluated and the relationships between the severity of mood symptoms and sociodemographic and clinical characteristics were examined.

Statistical Analysis

SPSS.23 software for Windows was used for statistical analysis. Numerical variables are summarised as mean±standard deviation and median [25th-75th percentile] values. Categorical variables are shown with numbers and percentages. For compar-

isons between groups with and without exacerbation of disease symptoms, chi-square test or Fisher's exact test was used for categorical variables and Mann Whitney U test was used for continuous variables. Wilcoxon test was used to compare the change in HAM-D scores over time. Significance level was accepted as $p<0.05$ for all analyses.

RESULTS

The data of 94 patients were accessed for the study. Nine of the patients could not be reached and it was learnt that two patients died as a result of suicide. Of the 83 patients who were contacted by telephone, 16 patients refused to participate in the study, and 67 patients who accepted to participate were included in the study. Of the 67 patients who participated in the study, 44 (65.7%) were found to be female and the mean age was 45.8±19. Of the participants, 23.9% were literate-primary school graduates, 43.2% were secondary school-high school graduates, and 32.9% were at least higher education graduates. Of the participants, 16 (23.9%) were working, 16 (23.9%) were retired and 35 (56.2%) were not working. Among the participants, 52.2% were married, 23.9% were single, 14.9% were divorced or separated, and 9% were widowed. Of a total of 67 patients, 30 (44.8%) were interviewed face-to-face in the outpatient clinic, 36 (53.7%) were interviewed via telepsychiatry methods, and 1 (1.5%) was interviewed face-to-face while hospitalised in the inpatient ward with a new diagnosis of a mood episode. The mean time elapsed since the diagnosis of mood disorder was 144.5 ±123.9 months, while the mean duration of hospitalisation before the pandemic was 41.6 ±24.8 days. The clinical characteristics of the patients in the pre-pandemic hospitalisation period and during the evaluation during the pandemic period are shown in Table 1.

The median and interquartile range (IQR) of the HAM-D scale scores of patients discharged with a diagnosis of major depression (n=39) during the discharge period (before the pandemic) were 7.0 (5.0-10.0), while their scores during the pandemic period were 9.0 (3.0-13.25), and no statistically significant difference was found between the two periods ($Z=-1.186$, $p=0.236$). The median HAM-D scores of patients discharged with a diagnosis of Bipolar Affective Disorder Depressive Episode (n=16) were calculated as 7.0 (3.0-13.0) in the discharge period (before the pandemic) and 10.0 (4.5-20.5) in the pandemic period, but no statistically significant difference was found ($Z=-1.016$, $p=0.310$). None of the patients diagnosed with Bipolar Affective Disorder had mania/hypomania.

When the HAM-D scores applied to all patients during the pandemic period were analysed, it was observed that the proportion of patients with a score of 8 and above (clinical depression of mild or higher severity) was 55.2% (n= 37) (Table 1). The comparison of patients with mild or higher severity depression (HAM-D ≥8) and patients without depression in terms of clinical and sociodemographic characteristics during the pandemic period is shown in Table 2.

DISCUSSION

The severity of the disease symptom determined by the scales applied in the evaluation made 9 months after the onset of the pandemic was compared with the symptom severity determined by the same scales at the time of discharge; the relationship between the severity of mood symptoms in the second wave of the pandemic and factors such as the level of fear of COVID-19, access to treatment, treatment compliance, and having COVID-19 disease was investigated.

In the last 1 year before the onset of the pandemic, 58.2% of mood disorder patients who were hospitalised in a psychiatric service were discharged with a diagnosis of major depression and 41.8% with a diagnosis of bipolar affective disorder, and in 41.8% of the patients, the affective period was accompanied by psychotic symptoms (psychotic depression: 10 patients, 14.9%; psychotic bipolar depression: 6 patients, 9.0%; psychotic mania: 12 patients, 17.9%), 56.7% were planned to be followed up with a mood stabiliser requiring blood level monitoring. Of a total of 38 patients using mood stabilisers requiring blood level monitoring, 20 patients reported that they experienced problems in having their blood levels checked in the first nine months of the pandemic. The percentage of

Table 2. Comparison of patients who scored 8 and above on the HAM-D scale in terms of clinical and sociodemographic characteristics during the pandemic period

	Group 1 (N=30) HAM-D <8	Group 2 (N=37) HAM-D>=8	Statistical analysis
Variables	Average±SD	Average±SD	
Age	44,3 ±17,3	47,0±20,4	p=0.570* Z=-2.679
COVID-19 Fear Scale	14.1±4.6	16.3±5.8	p=0.131* Z=-1,510
	N (%)	N (%)	
Diagnosis of Discharge Major Depression BAD depression BAD mania	 16 (53) 6 (20) 8 (27)	 23 (63) 10 (27) 4 (10)	p=0.236+ χ^2=2.89
Gender Female Male	 20 (45,5) 10 (43,5)	 24 (54,5) 13(56,5)	p=1.000+ χ^2=0.024
Additional psychiatric diagnosis	3 (10)	12 (33)	p=0,058+ χ2=4.798
Additional physical disease	14 (47)	21 (57)	p=0,564+ χ2=0.676
Those who have had COVID-19 themselves	0 (0)	7 (43,2)	p=0,014+ χ^2=6.388
Those whose relative have had COVID-19	4 (13)	11 (30)	p=0.191+ χ^2=2,563
Quarantine	3 (11)	9 (32)	p=0.230+ χ^2=2,312
The level of knowledge about the pandemic High Medium-Bad	 24 (80) 6 (20)	 18 (48,6) 19 (51,4)	P =0,017+ χ^2 =6,962
Disruption in drug treatment	8 (26,6)	10 (27)	p=1.000+ χ^2=0,001
Mental complaints leading to the use of psychiatric services in the early period of the pandemic	18 (60)	34 (94)	p=0.005+ χ^2=9,698
Expectation of additional psychiatric intervention	4 (13,3)	19 (51,4)	P =0,002+ χ^2 =10,622
Medication requiring blood monitoring	17 (57)	21 (57)	P =1,000+ χ^2 =1,000

*: Mann Whitney U Testi, +: Chi-square test of Fisher□s Exact Test
SD: Standard Deviation, HAM-D: Hamilton Depression Rating Scale

patients whose medication use was reported to be disrupted during the pandemic period was 26.9%, which was not higher than the rate of patients (22.4%) whose treatment compliance was reported as moderate-low before the pandemic. Although 77.6% of the patients reported that they used mental health services in the first 9 months of the pandemic, the expectation of additional intervention that was not met during the pandemic period was reported as 34.3%. It was thought that a significant percentage of patients were able to prescribe the psychotropic drugs they were using in the first nine months of the pandemic, but they could not reach a mental health professional and benefit from an effective intervention regarding their emerging or exacerbated mental symptoms.

In the clinical interview conducted with patients who were re-evaluated for various clinical features 9 months after the onset of the pandemic, no signs of mania/hypomania were detected in any patient. The HAM-D scale was administered to all patients and it was observed that the mean scores obtained from the scale were 9.4 ±6.9 and the proportion of patients who scored 8 and above on the HAM-D scale was 55.2%. Accordingly, it was determined that more than half of the patients had clinical symptoms of depression during the pandemic period. In order to determine the factors determining the high proportion of patients who were observed to be unstable in terms of mood symptoms during the pandemic period, patients with clinical depression were compared with patients without depression (those who scored below 8 points on the HAM-D scale) in terms of various sociodemographic and clinical characteristics. The rate of ha-

ving clinical symptoms of depression in those with an additional diagnosis of a psychiatric illness was statistically significantly higher than those without an additional diagnosis (p=0.058, $\chi 2$=4.798). Publications in the literature showing that the coexistence of major depression and anxiety disorder diagnoses before the pandemic during the COVID-19 period is associated with more worsening in symptoms than the presence of these disorders alone supports this finding in our study (23,24).

According to the mean scores obtained from the COVID-19 Fear Scale, the group with clinical depression did not differ from the group without depression (Table 2), while the rate of scoring 8 and above on the HAM-D scale was found to be statistically higher in people who had COVID-19 infection compared to those who did not have infection (Table-2). Increased proinflammatory cytokines (IL-6, CRP) and triggered neuroinflammation during COVID-19 infection may lead to cognitive, emotional and behavioural changes associated with depression. Oxidative stress and activation of the hypothalamus-pituitary-adrenal (HPA) axis may trigger depressive symptoms by causing neurotransmitter imbalances (25, 26). In addition to these biological processes, psychological stress, social isolation and trauma caused by infection further increase the risk of depression (27,28). The biological and psychosocial effects of COVID-19 may play a role in the development of depression. Therefore, it can be argued that the high rate of HAM-D scores of 8 and above in people with COVID-19 in our study is related to the biological and social effects of infection. People who reported being in quarantine because they or a contact person was diagnosed with COVID-19 infection did not have different rates of depression than those who were not in quarantine. The percentage of people whose level of knowledge about the pandemic was determined as moderate-poor was found to be statistically significantly higher in the group with clinical depression (respectively: 51.4%, 20.0%; P =0,017,$\chi 2$ =6,962)). During the COVID-19 pandemic, it has been shown that information provided through telephone calls alleviated symptoms of depression and anxiety (28), while misinformation (29) or excessive exposure to information (30) was associated with negative outcomes such as increased depression, feeling of helplessness and overwhelm. In the light of this information and the finding in our study, it can be said that lack of accurate and sufficient information about COVID-19 is related to an increase in the frequency of depression.

During the evaluation conducted in the late period of the pandemic, patients were asked whether they had mental complaints that led to the use of psychiatric services in the early period of the pandemic, and it was observed that 94% of patients with clinical depression in the ninth month of the pandemic had elevated mental symptoms at a level to seek treatment in the early period. Although this rate was also high (60%) in patients without clinical depression, it was found to be statistically significantly higher in patients with clinical depression (p=0.005, $\chi 2$=9,698). It is known that there are significant obstacles related to access to mental health services as well as disruptions in all health services during the pandemic period (31). For this reason, patients were also asked whether they had any unmet expectations for psychological intervention in addition to the mental health services they were able to receive. It was also observed that this expectation was statistically significantly higher in the group of patients with clinical depression (frequency in the clinical depression group: 51.4%; frequency in the other group: 13.3%, p=0.002, $\chi 2$ =10.622). It was thought that the lack of access to mental health services since the early stages of the pandemic may have contributed to the high rate of patients with clinical depression in the ninth month of the pandemic. Although there is no clear literature information on this issue, some studies have been found to associate the worsening of the symptoms of patients with various mental disorders in the pre-pandemic period with the inability to access mental health services during the pandemic period (31, 32). Similar to our study, in a study conducted in the first 8 months of COVID-19, an increase of 37% and 29% in anxiety and depression symptoms was observed, and it was stated that this increase may be associated with difficulties in accessing mental health services (33).

In many studies evaluating the level of psychopathology and related factors in patients with mood disorders during the pandemic, mental symptoms and sociodemographic and clinical characte-

ristics were examined through self-report scales and questionnaires. The strength of this study is that the level of mental symptoms was determined with clinical interviews and structured scales, and there are limited studies in the literature on pre-pandemic and post-pandemic evaluation. However, the limitations of the study include the relatively small sample size, the fact that the severity of mental symptoms of a small number of patients diagnosed with mood disorders who were discharged with mania/hypomania symptoms before the pandemic could not be compared between the pre-pandemic period and the pandemic period, the relatively short follow-up period, the limited objectivity of the assessment of treatment compliance before the pandemic, the determination of treatment compliance and use of health services during the pandemic period based on the statements of the patients, and finally, some of the data obtained in the interviews were based on the subjective statements of the patients.

In conclusion, it was observed that the patients who were hospitalised for the treatment of mood disorder symptoms before the pandemic and discharged after their symptoms responded to the treatment continued to have mood symptoms at the clinical level in the evaluation made in the ninth month of the pandemic, the symptoms detected were depressive, and the factors associated with the presence of depressive symptoms at the clinical level were characteristics such as having COVID-19 infection, having limited knowledge about the pandemic, and having an unmet expectation of medical intervention related to mental complaints in the first 9 months of the pandemic.

In the later stages of the COVID-19 pandemic, patients with mood disorders can be considered to have adapted to pandemic conditions to a certain extent, like the general population. However, while arrangements for follow-up examinations and drug supply facilitate access to treatment for some patients, it is anticipated that disruptions in health services may cause additional difficulties (14). On the other hand, the fact that the pandemic continued for a longer period of time than expected and that there is not yet an effective treatment for the infection has caused many people to witness the loss of their relatives and acquaintances and to continue to fear COVID-19. In addition to all these, psychosocial difficulties such as unemployment, poverty, loss of support due to being away from social networks, loss of routine, and uncertainties related to the near and distant future caused by the pandemic may be considered to have a negative effect on the mental state (15). Considering the findings in the literature and the results of our study, additional interventions and measures to address the needs of vulnerable groups, such as patients with mood disorders, will contribute to protecting the well-being of patients during future epidemics. Future research that overcomes the limitations of our study will increase our knowledge about these interventions and measures.

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Psychiatric symptom levels and perceived family functioning in adolescents who underwent endoscopy and gastric biopsy for gastrointestinal disease symptoms

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SUMMARY

Objective: Our knowledge of the links among gastrointestinal diseases, psychiatric disorders and family environment in adolescents is largely based on very limited data. Thus, this paper aims to examine the psychiatric symptom levels and family function areas in youths, who underwent endoscopy and gastric biopsy because of gastrointestinal complaints and compare their results with healthy controls.

Method: Patients aged 12-18 who were scheduled to undergo diagnostic endoscopy at the Gastroenterology outpatient clinic of a Pediatric Hospital, and age and gender- matched healthy controls from the COVID-19 vaccination outpatient clinic of the same hospital have been referred to Child and Adolescent Psychiatry Unit. Adolescents who were determined to have clinically normal intelligence in the psychiatric evaluation conducted by a Child and Adolescent Psychiatry specialist, were enrolled. Revised-Child Anxiety and Depression Scale (R-CADS) was used to assess depressive and anxiety symptom levels and Family Assessment Device (FAD) to determine family functionality.

Results: Worse general family functioning is positively correlated with higher anxiety levels and total internalizing scores in the study group. Family history of any medical disease was detected to be statistically significantly higher in the "endoscopic findings +" (with abnormal signs) group

Discussion: Contrary to expectations, we did not find a significant difference between patients with gastrointestinal problems and healthy controls in terms of psychiatric symptom levels. However, it's worthwhile noting that higher Protection Factor Index (PFI) (academic achievement and socio-economic status) and better family functions predicted lower depression scores of patients with gastrointestinal problems.

Key Words: Gastrointestinal disorders, functional; psychiatry; adolescent; family functions

INTRODUCTION

In recent years, the fact that the interaction between the human gastrointestinal tract and the CNS (Central Nervous System) plays a crucial role in the development of various neuropsychiatric disorders is among the most commonly discussed (1-3). It is generally accepted that the system called the brain-intestinal axis includes the CNS, autonomic nervous system, enteric nervous system, hypothalamus-pituitary-adrenal (HPA) axis and the connections, established between them by neural, immunological, endocrine and metabolic pathways (4-8). One of the several explanations for co-occurrence of both the symptoms of chronic gastrointestinal disorders and psychiatric disorders is that the excessively increased activity of the HPA axis, which regulates the stress response (9, 10). In the literature, there are a few examples of neurophysiological studies in patients with Inflammatory Bowel Disease (IBD), the most prevalent chronic gastrointestinal disorder in which psychological factors are frequently investigated have shown alterations in specific brain regions and task-related networks associated with stress response, cognitive flexibility, and autonomic hyperarousal functions. These alterations, which lead to information processing abnormalities in areas associated with

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stress hyperresponsiveness, biased threat appraisal, and cognitive inflexibility, have suggested to be similarly demonstrated in also anxiety disorders (11).

Clinical research, as well has been pointing out the fact that gastrointestinal symptoms could significantly affect quality of life of children and adolescents regardless of the reason (organic or functional) (12,13). Endoscopy has frequently been used for diagnosis in patients feature with gastrointestinal symptoms such as epigastric/abdominal pain, burning, nausea-vomi-ting, bloating but the endoscopic findings haven't always got explanation for these symptoms. When the structural abnormalities related to the organic diseases cannot be demonstrated, the conditions have been diagnosed as functional gastrointestinal diseases (FGID). Considering the factors related to unnecessary endoscopic procedures such as invasiveness, potential risk of harm and additional financial burden to health system; it would be important to reveal the features children and adolescents with organic/functional gastrointestinal diseases have (14). Therefore, clarifying accompan-ying psychopathologies and psychosocial factors in children and adolescents with organic/functional gastrointestinal diseases has been attracting consi-derable interest in recent years in order to reduce unnecessary tests, organize tailored treatments and interventions to improve the course of the disease. It is also well known that healthy/unhealthy family functions are associated with the individual's psychosocial adjustment (15-17). From this point of view, the present study has aimed to assess the relationships among gastrointestinal diseases, psychiatric symptom levels and family functions in adolescents, who underwent endoscopy and gastric biopsy because of gastrointestinal complaints and compare them with healthy controls. This paper is also a preliminary attempt to investigate whether there is a difference in terms of psychiatric problems and family history of medical/gastrointestinal or psychiatric disorders between the youths whose diagnosis of gastritis or ulcer was confirmed by histopathologically and those who did not have abnormal signs.

METHODS

Procedures

Youths aged 12 to 18, who were planned to undergo endoscopy after applying to the Gastroenterology outpatient clinic of a pediatric hospital due to gastrointestinal complaints between May and December 2022 and referred to the Anesthesiology and Reanimation outpatient clinic constituted the study group. After obtaining written consent from the youths, necessary diagnostic endoscopy was performed, and biopsies were taken by a pediatric gastroenterology specialist. Biopsies were analyzed by an experienced pathologist. The healthy control group, on the other hand, was formed by selecting from adolescents in the same age group and matched in terms of gender with study group who applied to the COVID vaccine polyclinic and did not have a chronic medical disease or psychiatric application. Adolescents, who had not previously had diagnoses of chronic GIS (gastrointestinal system) disease/any other chronic disease or psychiatric disorder, were referred to the Child and Adolescent Psychiatry specialist. According to the psychiatric interview, adolescents who had the impression of clinically normal intelligence, and who agreed to participate in the study were included and participants were asked to fill out the Revised Child Anxiety and Depression Scale (RCADS), Family Assessment Device (FAD) and a case report form, which was created by the child and adolescent psychiatrist. The sociodemographic characteristics (age, gender, annual grade point average (1-5) of the patients and age, education level, employment status, monthly income of the parents), medical history and diagnosed medical disease or gastrointestinal complaints presence of their family members were included in the case report form. Necessary permissions for the study were obtained from Uludag University, Faculty of Medicine Clinical Research Ethics Committee (date 13.04.2022 and number 2022-8/3). The present study was conducted in compliance with the Declaration of Helsinki.

Measures

Revised Child Anxiety and Depression Scale-RCADS: RCADS is a self-report scale which was

used to evaluate depression, anxiety disorders and obsessive-compulsive disorder in children and adolescents and it was developed by Chorpita et al. (18). Each of 47 items of the scale is scored 0 to 3. Although scores are calculated separately for Social Phobia, Panic Disorder, Separation Anxiety Disorder, Generalized Anxiety Disorder and Obsessive-Compulsive Disorder, the "total anxiety score" is calculated by adding these subscales; The "Internalizing Disorder" score can be obtained by adding the total anxiety score and the Depressive Disorder score. The Turkish validity and reliability study of the scale was performed by Görmez et al. (19). The authors emphasized that the evidence that the scale is a valid and reliable tool for Turkish population was satisfactory. In our study the child form was filled by the adolescent herself.

Family Assessment Device: In our study, the "Family Assessment Device" was used to evaluate family functions. The scale developed by adapting the Mc Master family functions model; The model consists of 6 sub-dimensions ("problem solving", "communication", "roles", "affective responsiveness", "affective involvement", "behavior control") and a 7th subscale that includes a general assessment. Each of the 60 items of the scale, which is filled by family members older than 12 years of age, is scored between 1 and 4. High scores indicate ineffective family functions. "2 points" are deemed as the cut-off value for the healthy/unhealthy distinction (20). The Turkish validity-reliability study of the scale was done by Bulut. Psychometric properties of the original scale were satisfactory, and the use of 60-item version was supported in the same study (21). In our study, family functions were assessed based on youth reports.

Statistical analyses

Data were analyzed using the Statistical Program for Social Sciences- SPSS for IBM, 20.0. Descriptive statistics were presented as mean, standard deviation, or frequency (%). Chi-square test was used to determine the gender distribution between study group and controls and in comparisons of endoscopic findings +/- groups. Mann-Whitney U-test was used to evaluate age and socioeconomic status (SES). SES was calculated in SPSS by considering the variables of mother's education level, father's education level, mother's employment status and monthly income level. Although the educational level and working status of the parents were ordinal variables, they were accepted continuous variables and the sum of the scores was expressed as socio economic status (SES). Academic achievement level which was an ordinal variable (1-5) was also considered as a continuous variable. Independent-sample t-test was used for normally distributed data, and Mann-Whitney U-test was used for data that did not show normal distribution in the comparison of RCADS and FAD total score and subscale scores. Pearson correlation test was used to evaluate the correlation among the subscale scores in the study group. Statistical significance value was determined as $p < 0.05$.

RESULTS

The patient group was consisted of 55 adolescents who were planned for diagnostic endoscopy in the gastroenterology outpatient clinic between May and December 2022. However, after completing the researcher form, 2 participants who were found to be under treatment for chronic medical diseases such as Hashimoto's disease (n=1) and asthma (n=1), and 3 participants who were under psychiatric treatment and follow-up were excluded from the study group (n=50). After removing 1 patient who used Levothyron for thyroid dysfunction and one another who was revealed to be under treatment for allergic asthma, 46 people formed the control group.

In 11 of 50 cases, who met inclusion criteria for study group, no pathological sign was observed in endoscopy, and the histopathological results were normal. It has been revealed that of the remaining 39 cases; 1 had Celiac Disease, 3 had peptic ulcer and 35 had gastritis findings. One, whose pathological result was compatible with Celiac Disease, were not included in the statistical analysis in order to obtain more homogeneous sample.

The average age was (M=15.34, SD=1.6) of the participants in the study group and (M=14.86, SD=1.8) in healthy controls. The majority of par-

Table 1. Group comparisons regarding RCADS and FAD subscale scores.

	Study group	Control group	95% Confidence interval of the difference		Z/t	p
	Mean–SD	Mean–SD	lower	upper		
RCADS						
Social Anxiety Disorder	11.03–6.4	10.93–6.1	-2.43	2.55	.046	.963[a]
Panic Disorder	9.42–6.8	7.46–5.8	-.58	4.50	-1.422	.155
SAD	4.20–3.5	3.25–2.7	-.33	2.23	-1.109	.267
GAD	7.74–3.9	7.63–4.0	-1.49	1.69	.127	.899 [a]
OCD	6.24–4.1	5.97–4.3	-1.41	1.95	-.447	.655
M. depression	11.09–7.4	9.38–6.8	-1.13	4.55	-1.050	.294
Total Anxiety	38.13–21.6	31.10–16.8	-.78	14.83	-1.398	.162
Total Internalizing score	49.25–27.8	40.48–22.1	-1.35	18.87	-1.157	.247
FAD						
Problem Solving	1.80–.6	2.12–.7	-.53	-.006	-2.225	**.026**
Communication	1.86–.5	1.87–.5	-.21	.23	-.052	.959
Roles	1.92–.4	2.00–.4	-.24	.11	-.793	.428
Affective Responsiveness	1.82–.7	1.75–.7	-.19	.39	-.420	.675
Affective Involvement	2.35–.3	2.28–.4	-.09	.22	-1.221	.222
Behavior Control	2.07–.3	2.03–.3	-.10	.17	-.736	.462
General Functioning	1.70–.6	1.73–.6	-.25	.24	-.049	.961

RCADS: Revised Child Anxiety and Depression Scale; FAD: Family Assessment Device; SAD: Separation Anxiety Disorder GAD: Generalized Anxiety Disorder; OCD: Obsessive Compulsive Disorder
Mann Whitney U test [a]Independent samples-t test for social anxiety disorder and GAD variables

ticipants were girls (43) (87.7%) and only 6 (12.2%) of them were boys in the study group. Of the healthy controls, matched in terms of gender with study group, 41 (89.1%) were girls and of 5 (10.9%) were boys. Study and healthy control groups were similar with regard to age (z=-1.416, p=.157), gender (fisher's exact test=.570) and SES (z= -1.394, p=.163).

The most common gastrointestinal complaint of the patients in the study group was pain (abdominal, gastric) 69.0%, followed by nausea-vomiting 17.2%, burning 10.3%, swallowing difficulties 3.4%.

Except for GAD, all RCADS sub-scores were higher in the patient group. However, none of these differences were statistically significant. Moreover, there was no significant difference between groups with regard to FAD sub-scales except for problem solving. The average score of the problem-solving subscale of the patient group was statistically significantly lower than the healthy controls (z=-2.225, p=.026). (Table 1).

As anticipated, correlation analyses have revealed that there was significant negative relationship between SES and total anxiety score (p=.037, r=-.312) and total internalizing score (p=.025, r=-.334) sub-scales of R-CADS of the study group. In addition, the "general functioning" subscale of FAD was significantly correlated with total anxiety score (p<.001, r=.623) and total internalizing score (p<.001, r=.655) (Table2).

When 11 cases with normal endoscopy and pathology results and 38 cases with abnormal findings were compared regarding familial factors; the rate of having family history of psychiatric illness (X^2=.658) and the rate of having family history of gastrointestinal disease (X^2=.578) were similar in both groups, while family history of any medical disease aspect (X^2=.034) was found to be statistically significantly higher in the positive result group (with abnormal signs). Categorical variables were formed according to the cut-off values with optimum specificity and sensitivity for each subscale, determined in the Turkish validity and reliability study of the RCADS scale and the group with endoscopic finding - and + were compared. There

Table 2: Correlation analyses in the study group

		SES	Total anxiety	Total int.	GF	PS	Com.	Roles	AR	AI	BC
SES	P										
	R										
Total anxiety	P	**.037***									
	R	**-.312**									
Total int.	P	**.025***	**.000****								
	R	**-.334**	**.986**								
GF	P	.631	**.000****	**.000****							
	R	-.072	**.623**	**.655**							
PS	P	.920	**.000****	**.000****	**.000****						
	R	.015	**.489**	**.523**	**.847**						
Com.	P	.698	**.000****	**.000****	**.000****	**.000****					
	R	-.058	**.433**	**.464**	**.762**	**.747**					
Roles	P	.739	**.004****	**.002****	**.000****	**.000****	**.000****				
	R	-.050	**.394**	**.416**	**.741**	**.615**	**.571**				
AR	P	.551	**.000****	**.000****	**.000****	**.000****	**.000****	**.000****			
	R	-.089	**.539**	**.570**	**.769**	**.652**	**.639**	**.661**			
AI	P	.201	.101	.058	**.000****	**.000****	**.008****	**.000****	**.000****		
	R	.190	.230	.265	**.496**	**.425**	**.358**	**.517**	**.577**		
BC	P	.831	.400	.501	**.020***	.075	.294	**.005****	**.004****	**.000****	
	R	.032	.119	.095	**.315**	.244	.146	**.376**	**.386**	**.493**	

were no significant differences in terms of psychiatric symptom levels between the two groups.

Further analyses were performed to detect the effects of risk and protection factors on psychiatric symptom levels and family functionality in the study group. Having a family history of any chronic medical disease, having a family history of gastrointestinal disease and having a family history of psychiatric disease, which are dichotomous variables, were added up to the risk factor index (RFI). Academic achievement level and SES variables formed the protection factor index (PFI). Hierarchical linear regression analysis was carried out to examine factors predicting depressive symptom levels in the study group. The general functioning subscale of FAD was entered as the first block and the results indicated that the model was significant ($F = 20.250$, $p < .001$), and 34.2 % of the variance was explained by the model in the hierarchical linear regression analysis. After entry of the PFI variable at the second block, the model was still significant ($F = 13.928$, $P < .001$) and total variance explained by the model as a whole was 42.3 % (R squared change = .081). In the model 2; the PFI significantly predicted lower depressive symptom scores in adolescents ($B = -.527$, $p = .026$). The general functioning variable were still statistically significant ($B = 6.119$, $p < .001$) (Table 3).

DISCUSSION

The present findings have demonstrated that there was no statistically significant difference between study group and healthy controls regarding psychiatric symptom levels. This was probably as a result of the fact that the data of psychiatric symptoms and family function areas were based on only adolescents' self-reports in the current study. This apparent lack of significant difference between groups can be attributed to the fact that adolescents tend to underrate their own psychiatric problems. Another possible explanation for these results may be that the patients participated in our study were in the process of diagnosis, that is, the duration of their complaints would be relatively short. There was also no significant difference in terms of psychiatric symptom levels between patients with abnormal and normal pathological signs in the present study. However, these results

Table 3: Hierarchical linear regression analysis findings for variables predicting major depression symptom levels in study group.

	Unstandardized Coefficients		Standardized Coefficients Beta	p
	B	Std. Error		
Model 1				
General functioning	6.119	1.431	.535	<.001
Model 2				
PFI	-.527	.228	-.289	.026

Note: PFI (Protection Factor Index) was used as continuous variable

should be carefully evaluated due to the limited number of cases in the endoscopic finding-negative group. A few attempts have been made with the purpose of examining the differences before and after endoscopy in terms of psychiatric symptoms and quality of life (QofL). In a prospectively designed adult study, no significant alterations were found between pre- and post-endoscopy in terms of patients' quality of life, depressive and anxiety levels. Further, they did not find significant difference between those with and without organic abnormalities similar with our findings (22).

Moreover, we found no significant difference between the two groups regarding the subscales of family functionality except for the problem-solving area. It was observed that families in the study group showed better functionality in the problem-solving area. In their study on children with functional abdominal pain syndrome, Ghanizadeh et al. found that family functioning levels were not significantly different from the normal population, like our results (23). Our findings are in contradiction with a previous study of Özyurt et al. (2019) (24), which found that emotional and peer relationship problems were more common and family functionality was impaired in all areas of youths whose gastritis diagnosis was confirmed histopathologically. In that study without comparison with healthy controls, "2" were determined as cut point for family functionality sub-domains, and it was detected that the average score of the participants in all domains was found to be above 2. According to the results of the review article evaluating the family functioning of children with functional gastrointestinal disorders; the impairment in family functioning was detected to be more than in the healthy controls in the majority of the studies. In addition, it has been suggested that the difficulties may have experienced by children with gastrointestinal disorders and their families were in certain areas according to the consistent findings on worse family functionality in the fields such as roles, communication, and affective involvement. Relationships with individual psychosocial factors such as children's perceived quality of life and self-perception were investigated; a positive relationship was found between psychiatric problems and poor family functioning, while an inverse relationship was found with positive self-concept (25). The lower levels of current psychiatric symptoms of the cases may have led to their better functionality in the problem-solving area, or reversely, the level of psychiatric symptoms may have been lower because their problem-solving skills are good in the present study.

One of the remarkable findings of our study is the fact that the significant portion of the adolescents, who applied to the gastroenterology outpatient clinic during 8-month period and were scheduled for an endoscopy examination, were girls (87.2%). Considering the results in terms of gender in studies investigating the relationship between functional or organic gastrointestinal diseases and psychological problems; female gender was associated with multiple gastrointestinal complaints and high levels of depressive symptoms. In an adult study, the abdominal pain severity of the patients with functional bowel disorders was found to be positively associated with depression for women (26). Although findings on children and adolescents are scarce, epidemiological data of children and adolescents with functional abdominal pain show that girl gender is leading (27,28).

Our results would seem to suggest that worse general family functioning is positively correlated with higher anxiety levels and total internalizing scores, and better "general functioning" level is protective from depression. Although our study did not find a significant difference between those experiencing gastrointestinal symptoms and healthy controls in terms of psychiatric symptom levels, it lends support to the studies suggesting that negative family functionality or less resilient family patterns may be a determinant of psychiatric comorbidity and worse QofL (29, 30). Clinicians who deal with patients with gastroenterological complaints should refer patients to family-centered treatment focusing on general well-being, addressing concerns about treatments, or increasing motivation to comply with diet and medications. This approach would support reduce the incidence of psychiatric symptoms (31, 32).

It's fundamental to note that higher academic achievement level and SES were also found associated with lower depression scores in adolescents with gastrointestinal symptoms according to our

findings. The literature suggests that school absenteeism in children and adolescents with chronic illnesses may be related to academic challenges, but the low socioeconomic status of the family also mediates this link (33,34). Revealing educational and socioeconomical risk factors related to accompanying psychiatric problems in children with chronic diseases would enable developing preventive strategies such as school-based programs (35).

Given that our findings are based on a limited sample (especially number of cases in the histopathology normal group), the results from such analyses should therefore be treated with utmost caution. The fact that unintended bias related to majority of participants who made up the sample of our study was girls should also be taken into consideration. Additionally, only the adolescents themselves filled out the scales in which we evaluated psychiatric problems and family functioning. It is known that parents of children and adolescents with chronic gastrointestinal diseases are also accompanied by psychiatric problems, and they may be a confounding factor on the results regarding family functionality (36). Therefore, the fact that parents' psychiatric symptom levels were not evaluated is another limitation of our study.

Further data collection would be needed to determine whether there are factors vary in those with and without histopathological signs. Since it is well known children and adolescents with a chronic medical or psychiatric illness might be adversely affected by emotional and behavioral attitudes of family members, future works in which psychiatric diagnoses of both youth and their parents are evaluated with structured diagnostic interviews will contribute to the elucidation of psychological factors that predict organic diseases.

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Neuropsychological assessment of subjective memory complaints in patients referred to the consultation-liaison psychiatry

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SUMMARY

Objective: The aim of this study is to examine the cognitive functions of patients referred to the Consultation-Liaison Psychiatry (CLP) Department due to mental health issues from different medical specialties, who report subjective forgetfulness during psychiatric evaluation.

Method: The study sample recruited patients aged between 40 to 65, who were referred for mental health evaluation to the CLP Department of the Department of Psychiatry at Istanbul University Faculty of Medicine from all medical treatment units of the Faculty over the last 10 years (between 2014 and 2024). Cognitive assessments were conducted at the Clinical Psychology Laboratory of the Department of Psychiatry. In this retrospective study, all accessible data of the neuropsychological test (NPT) results were included to analyses (n=71). The results were compared with those of a matched healthy control group (n=23).

Results: Among patients reporting subjective forgetfulness, those referred from neurology had worse performance on forward digit span ($p=0.03$), semantic fluency ($p<0.001$), and Stroop Test error count ($p=0.02$), as well as memory encoding ($p=0.03$) and retrieval ($p=0.02$) scores compared to control group. Additionally, memory encoding ($p=0.02$) and retrieval ($p<0.001$) scores were worse in these patients than in those referred from other medical units.

Discussion: Our findings highlight differences in the NPT results of patients referred to the CLP department, offering important insights for understanding and clinical approaches to subjective forgetfulness. It should be considered that; subjective forgetfulness may not primarily be associated with psychological distress but underlying medical conditions may also play a significant role in cognitive dysfunction.

Key Words: Neuropsychological test, consultation liaison psychiatry, subjective memory complaint, neurocognitive functions

INTRODUCTION

Various departments in medical facilities encounter patients who declare concerns about memory in addition to their primary medical problems (1,2). In further examinations, some of these patients may have memory losses due to dementia, while others have normal memory test performances. Thus, in clinical studies, it is not uncommon to report differences between subjective memory complaints and objective memory test performances (3,4).

Mild Cognitive Impairment (MCI) and subjective cognitive decline (SCD) are two separate symptom classifications that define objective and subjective cognitive dissonance. Among these, amnestic MCI is characterized by a decline in the objective evaluation of memory according to age and education status along with the person's complaint of forgetfulness (5), while no objective cognitive decline is observed in individuals with SCD. The complaint of forgetfulness in individuals suffering from subjective memory complaint is more frequently associated with more psychological distress and poor

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quality of life (6).

Forgetfulness is a source of concern for individuals both in a psychological and social context; individuals may be affected by the negative consequences of forgetful behavior and may experience difficulties in their work, and family relations (7). Approximately 60% of individuals aged 45-65 who experience forgetfulness stated that their forgetfulness highly interferes with their daily living activities and approximately 70% of them stated that they are significantly 'worried' about their forgetfulness (8). Apparently, perceived forgetfulness can negatively affect individuals' daily routines and therefore their quality of life. Mol and colleagues showed in their 9-year follow-up study that perceived forgetfulness is associated with lower quality of life (9). However, the prominent finding of that study was about age ranges; the relationship between perceived forgetfulness and life satisfaction was stronger in middle-aged participants (54-69 years) than in older participants (70-91 years). Therefore, forgetfulness complaints of individuals in middle-aged group were found to be important to be the focus of research. The aim was to better understand the patients who are actively involved in both work and family life, but are also at an age where health issues may begin to emerge including risk of dementia.

Most of the physical illnesses are accompanied by psychological conditions or disorders (10). Therefore, each patient should be considered within the holistic interaction of biological, psychological and social factors. CLP, a division of general psychiatry, is a branch of science in which patients referred by other medical professionals are evaluated with a biopsychosocial approach (11). Patients followed in the CLP are not the ones that individually applied for psychiatric help, but are referred for psychiatric examination due to mental symptoms that have emerged or have been noticed by the treatment team during examination and treatment of their primary medical condition. Probable explanations may be related to an individual's awareness of their psychological distress, their ability to access institutions, and their willingness to seek psychological treatment. Above all, stigmatizing attitudes pose significant obstacles to seeking psychological help. In addition, some medical disorders inherently lead to psychological issues during the treatment process, and treatment methods or agents may cause psychological side effects. In neurological groups, cognitive complaints are often attributed to existing neurological conditions and psychiatric referrals are relatively rare unless there is a behavioral disorder. In other clinical departments, psychiatric conditions accompanying diseases are often neglected and in fact, these psychiatric conditions can present as cognitive difficulties (12–14) that may lead to distress in the person's life. These, in turn, can create difficulties in treatment adherence, lead to treatment rejection, and cause communication and relationship problems with the treatment team, which ultimately become the reasons why the primary treatment team refers patients to psychiatry. In this context, in the need of a comprehensive psychiatric evaluation of patients in CLP, psychometric tests are conducted in addition to the information gathered from the primary treatment team, the patient's caregivers, and the medical history. Among these tests, neuropsychological assessment can play a decisive role in the differential diagnosis, determining the frequency of follow-ups, and guiding decisions on pharmacotherapy, psychotherapy, or interventional treatment methods.

To the best of our knowledge, no studies have yet examined the neurocognitive profiles of patients with subjective memory complaints referred to CLP. The aim of this study was to investigate whether cognitive characteristics differ among patients with subjective memory complaints, depending on the medical specialties from which they are referred and followed. Our hypothesis is that, patients referred to the CLP with subjective complaints of forgetfulness will exhibit specific deficits in cognitive functions such as memory, attention, and executive functioning, which may be linked to their underlying psychiatric conditions.

METHOD

Sample

The sample of our study consisted of patients who were followed up by the CLP division of Istanbul University Faculty of Medicine between 2014 and

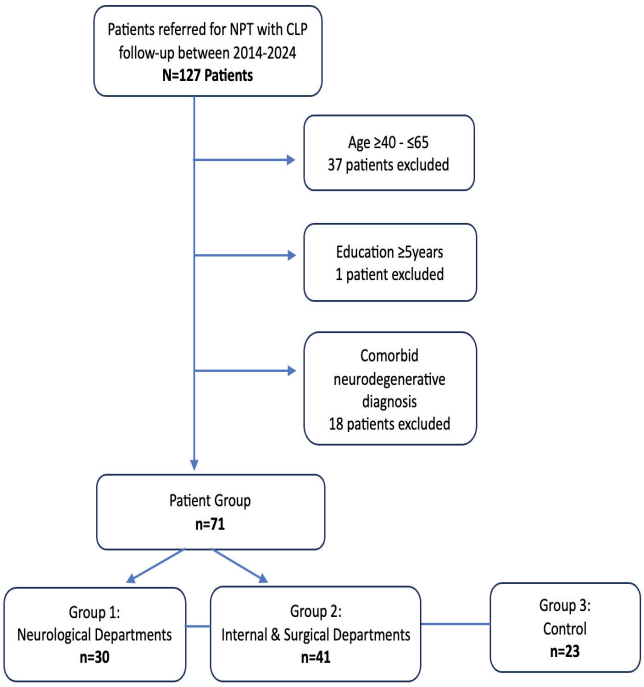


Figure 1. Chart flow of sample recruitment process

2024. These patients were referred to the Clinical Psychology Laboratory of the Istanbul University Faculty of Medicine Psychiatry Department for neuropsychological assessment tests (NPT) due to subjective memory complaints (SMC). All participants were aged 40-65 and had at least a primary school education. Individuals with a diagnosis of dementia, stroke, head trauma history with loss of consciousness, meningitis/encephalitis, brain tumor in their past medical records, mental retardation, psychotic disorders, alcohol/substance use disorder comorbidities, sensory losses that could restrict the performance of cognitive tests (advanced hearing or vision loss) and individuals who had never received formal education were excluded as each condition has its characteristic impact on cognitive skills. Patients were divided into two groups based on whether they were referred from neurological departments or other specialties, and then analyzed (Figure 1). Participants in the control group were invited through written announcements posted on the bulletin boards around our clinic. The exclusion criteria applied to the patient group were also valid for the control group.

Procedure

The data of the patient group with available NPT results were examined retrospectively. In addition to the electronic records from the Hospital Information Management System of Istanbul University Faculty of Medicine patient records from the CLP archive were also reviewed. The sociodemographic characteristics and medical histories of the patients followed during the specified study period were thoroughly evaluated. Patients whose medical records had more than 5% missing data for the variables studied were excluded from the analysis. Approval was obtained from the Istanbul University Clinical Research Ethics Committee (data: 22.03.2024, no: 06).

Sociodemographic and clinical information inventory: This inventory, prepared specifically for the study topic by the researchers, includes information on the sociodemographic characteristics of the cases such as age, education, economic status, living conditions, etc., as well as physical and psychiatric diseases, treatments applied, and clinician observations.

Cognitive domains and neuropsychological tests: The neuropsychological tests used in the study are presented separately according to each cognitive domain. Among these, the Wechsler Memory Scale's forward digit span (15,16) was used to assess attention skills. Wechsler Memory Scale's backwards digit span, word fluency (17),(18), the Stroop Test (19,20), and the Clock Drawing Test (21) as well as the Wechsler Adult Intelligence Scale (WAIS-R, 1987) abstract thinking (comprehension and similarities) subscale scores were used to assess executive functions. In clinical neuropsychological applications, word fluency test is applied with semantic (animal names) and phonemic categories (words starting with letters K, A, S), each lasting one minute. Planning skill from executive functions is assessed with Clock Drawing Test (CDT). In this study, CDT scores based on 5-point Likert-type Shulman scoring system (22) were included in the analysis. Visual-spatial perception was assessed with Benton Face Recognition Test (BFRT) scores (20,23). For memory assessment, scores from 15-word Öktem Verbal Learning Processes Test (24) that evaluates immediate recall, learning ability, delayed free recall and recognition processes were used. Confrontational naming skill was also assessed with Boston Naming Test (BNT) scores (25).

Table 1. Sociodemographic variables of groups

	Group 1 (n=30)		Group 2 (n=41)		Group 3 (n=23)				
	M	SD	M	SD	Ort	SS	F	p	n^2
Age	56.60	8.97	55.24	7.88	60.13	6.75	2.775	0.07	0.06
Education (years)	8.58	4.17	6.85	3.18	8.30	3.69	2.243	0.11	0.05
	n	%	n	%	n	%			
Gender (F)	22	73.33	35	85.37	15	65.22			

Abbreviations: M: Mean; SD: Standard deviation; F: ANOVA value; n^2 : partial eta square; F: Female.

Statistical analyses

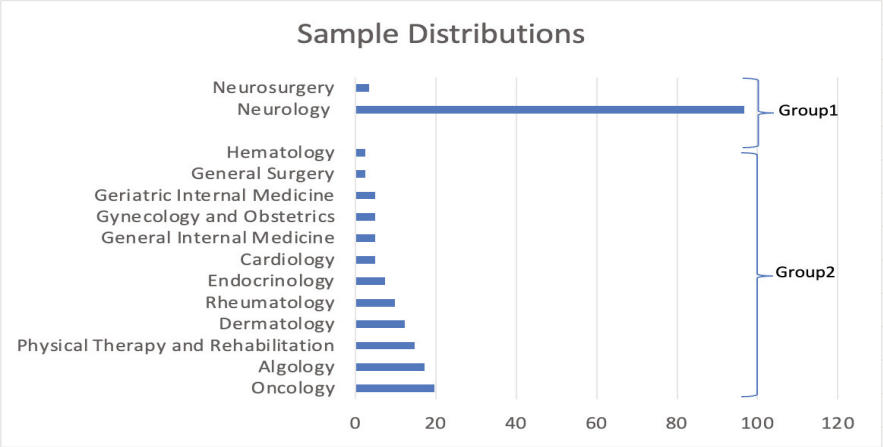
The normality of the measurements was assessed using the Shapiro-Wilk test, based on the sample size. One-way analysis of variance (ANOVA) was performed to examine differences in cognitive measurements between groups, while the t-test was used for pairwise comparisons of independent groups. Post hoc analyses were conducted to determine the direction of the significant findings in the ANOVA. The proportions of categorical variables within the sample were reported as percentages.

As the study design was retrospective, some test scores were converted to t-scores for inclusion in the analysis. Depending on the patients' level of cooperation, educational background, and referral questions, the number of proverbs and binary similarities used in the neuropsychological tests to assess abstraction skills, the number of items in the Boston Naming Test and the number of words used in verbal memory tests, were converted to t-scores. This was done to avoid errors in the analysis caused by variations in the number of words used in the verbal memory tests. All other test scores were included based on raw scores. The significance level for all analyses was set at 0.05.

RESULTS

The study sample consisted of 71 patients and 23 matched controls. Patients were divided into neurology (Group 1; n=30) and other (Group 2; n=41) according to the clinics to which they were referred. The distribution according to clinics is given in Graph 1. Among those three groups there were no significant difference in terms of educational status (F (2,91)=2.243; p=0.11) and average age (F(2,91)=2.775; p=0.07). The sociodemographic characteristics of the sample and the medical branches from which they were referred to CLP are shown in Table 1.

The forward digit span of the three groups constituting our sample are significantly different from each other (F (2,91)=3.26; p=0.04; Table 2). This variance revealed to have mild to moderate effect size (η2=0.07). According to post hoc analyses, after Bonferroni correction, forward digit span of patients referred from neurology departments (Group 1; 4.57±0.9) and other clinics (Group 2; 4.59±0.77) was significantly lower than age and education matched controls (Group 3; 5.09±0.81) (p=0.03; p=0.03, respectively); attention skills of patients referred from neurology clinics and com-



Graph 1. Distribution of the sample according to the departments to which they were referred

Table 2. Group means and one-way analysis of variance results.

	Group 1 (n=30)		Group 2 (n=41)		Group 3 (n=23)				
	M	SD	M	SD	M	SD	F	p	n^2
Attention									
WMS-R attention subtest Digit span forward	4.57	0.90	4.59	0.77	5.09	0.81	3.264	0.04	0.07
Digit span backwards	3.27	0.87	3.48	1.01	3.82	0.73	2.368	0.10	0.05
Executive functions									
Clock Drawing Test	4.11	1.72	4.27	1.26	4.84	0.38	1.706	0.18	0.04
Abstraction-I Proverbs	0.90	0.23	0.95	0.11	0.97	0.08	1.360	0.26	0.03
Abstraction-II WAIS-R Word associations	0.82	0.16	0.77	0.18	0.84	0.21	0.796	0.45	0.02
Stroop Test Time difference	80.96	50.44	64.09	31.55	57.05	29.37	2.515	0.08	0.06
Error count	3.12	4.16	1.89	2.66	0.88	1.20	2.791	0.06	0.07
Spontaneous corrected errors	3.52	4.40	3.44	2.98	2.44	1.90	0.613	0.54	0.02
Phonemic fluency K-A-S	23.50	10.95	25.38	12.07	29.91	11.36	1.917	0.15	0.04
Semantic fluency Animal	14.77	4.40	16.82	4.69	19.55	4.91	6.704	0.002	0.13
Visuospatial perception									
Benton Face Recognition Test	44.72	4.53	44.64	4.54	48.65	3.67	5.241	0.008	0.15
Memory									
Immediate recall	47.04	9.24	48.92	8.52	52.64	13.91	1.108	0.37	0.03
Learning	50.85	7.51	55.29	6.59	56.16	6.95	3.684	0.03	0.09
Delayed recall	46.03	10.34	52.78	6.58	56.72	6.22	7.798	<0.001	0.18
Recognition	53.71	10.49	47.45	7.33	42.11	8.66	6.903	0.002	0.16
False positive recognition	50.76	9.19	47.20	7.61	49.28	5.19	1.306	0.28	0.04
Total retrieval	45.58	13.06	51.96	5.63	51.78	2.30	3.078	0.05	0.12
	Group 1 (n=30)		Group 2 (n=41)				t	*p*	*d*
Language									
Boston Naming Test	82.24	17.15	82.51	14.06			0.07	0.95	0.21

Abbreviations: M: Mean, SD: Standard deviation, F: ANOVAvalue, n^2: partial eta square; WMS-R: Wechsler Memory Scale-Revised; WAIS-R: Wechsler Adult Intelligence Scale; t: t-test; d: Cohen□s effect size.

plaining of SMC were impaired compared to the others (Table 3). In backwards digit span, no difference was observed in the variance analysis between the three groups; it was seen that they were at similar levels in terms of working memory.

The Clock Drawing Test was scored using a 5-point Likert scale according to the Shulman scoring system. There were no significant differences on CDT scores between three groups (F(2,91)=1.706; p=0.18). Also in the Stroop Test, which evaluates interference effect, no difference was found between the groups in terms of the duration difference and spontaneously corrected errors. However, a trend level of difference was observed in the number of errors (F(2,91)=4.22; p=0.06). Post hoc analyses revealed that this difference was due to patients in Group 1 (3.12±4.16) making more errors than the healthy controls in Group 3 (0.88±1.20) (p=0.02; Table 3). Therefore, it can be concluded that patients referred from neurological departments (Group 1) may have difficulties in suppressing inappropriate responses. Among the verbal fluency assessments, a significant difference was observed in semantic fluency between the three groups (F(2,91)=6.52; p<0.001) with moderate to strong effect size (η2=0.13). Both Group 1 (14.77±4.40) and Group 2 (16.82±4.69) patients were able to name significantly fewer words than the control group (19.55±4.19) (p<0.001; p=0.02, respectively). However, no significant difference was observed between the groups in the phonemic fluency category (F(2,91)=2.00; p=0.15).

In the verbal memory assessment, according to variance analysis between the groups showed no significant difference in terms of immediate recall, which is the first step of the word list learning trials (F(2,91)=1.108; p=0.37; Table 2). However, a significant difference was observed in learning ability, as assessed by the total score from the learning trials (F(2,91)=3.684; p=0.03) with moderate effect size (η2=0.09). Post hoc analyses revealed that the total learning scores of healthy controls (Group 3; 56.16±6.95) were significantly higher than those of patients referred from neurological sciences

Table 3. Post Hoc comparisons of tests with significant differences between groups; p values.

Cognitive Tests	Group Comparisons			
		Mean Diff.	Std Error	p_{Tukey}
Attention				
WMS-R Digit span forward	Group1/Group2	-0.018	0.198	0.84
	Group1/Group3	-0.524	0.231	0.03
	Group2/Group3	0.505	0.217	0.03
Executive functions				
Stroop Test	Group1/Group2	1.231	0.791	0.35
Error count	Group1/Group3	2.245	0.973	0.02
	Group2/Group3	-1.014	0.913	0.25
Semantic fluency	Group1/Group2	-2.054	1.129	0.14
	Group1/Group3	-4.779	1.305	< 0.001
	Group2/Group3	2.725	1.240	0.02
Memory				
Learning	Group1/Group2	-5.251	2.183	0.04
	Group1/Group3	4.601	2.505	0.03
	Group2/Group3	-9.852	2.319	< 0.001
Delayed recall	Group1/Group2	-7.535	2.168	0.002
	Group1/Group3	-6.890	2.489	0.02
	Group2/Group3	-0.645	2.304	0.95
Recognition	Group1/Group2	5.872	2.273	0.03
	Group1/Group3	4.111	2.609	0.26
	Group2/Group3	1.760	2.415	0.74
Total retrieval	Group1/Group2	-9.222	3.388	0.02
	Group1/Group3	-10.924	3.542	0.008
	Group2/Group3	1.702	3.038	0.84
Visuospatial perception				
Benton Face Recognition Test	Group1/Group2	0.079	1.306	0.99
	Group1/Group3	-3.925	1.462	0.02
	Group2/Group3	4.004	1.330	0.01

Abbreviations: Mean Diff.: Mean Difference; Std Error: Standard Error; WMS-R: Wechsler Memory Scale-Revised.

(Group 1; 50.85±7.51) and other clinics (Group 2; 55.29±6.59) (p=0.03; p<0.001, respectively). Additionally, patients referred from other clinics scored significantly higher than those referred from neurological sciences (p=0.04) (Table 3).

According to the delayed free recall scores (approximately 20 minutes after learning process) a significant difference was found between the scores of the three groups (F(2,91)=7.798; p<0.001) with strong effect size (η2=0.18). Post hoc analyses revealed that the delayed free recall scores of the patient groups in Group 1 (46.03±7.51) and Group 2 (52.78±6.58) were significantly lower than those of the control group (56.72±6.22) in pairwise comparisons (p=0.002; p=0.02, respectively). Additionally, the variance in recognition scores among the three groups also showed a significant difference (F(2,91)=6.903; p=0.002)) with strong effect size (η2=0.16). However, no significant difference was observed between the patients referred from neurological sciences and those referred from other clinics in terms of delayed recall score. When recognition skill, the final stage of memory, was examined, Group 1 (53.71±10.49) showed a higher recognition score than Group 2 (47.45±7.33) (p=0.03; Table 3). Furthermore, the total retrieval score, calculated by adding the total learning score and recognition score, was examined, a significant difference was observed between the three groups (F(2,91)=3.078; p=0.05) with moderate to strong effect size (η2=0.12). This difference was derived from Group 1 (45.58±13.06) scoring significantly lower than both Group 2 (51.96±5.63) and Group 3 (51.78±2.30) (p=0.02; p=0.008, respectively; Table 3).

The visual-spatial skills were assessed using BFRT scores, a widely used test for visual and spatial perception. A significant difference was observed between the groups (F(2,91) = 5.241; p = 0.008), and post hoc analyses revealed that the control group (48.65±3.67) had significantly higher scores than both Group 1 (44.72±4.53) and Group 2 (44.64±4.54) (p < 0.001; p = 0.01, respectively).

Table 4. Distribution of diagnoses across groups following psychiatric assessment and cognitive evaluation.

	Group 1 n=41		Group2 n=30	
	n	%	n	%
Cognitive Decline	0		6	20
Major Depressive Disorder	32	78,05	15	50
Generalized Anxiety Disorder	2	4,88	6	20
Adjustment Disorder	2	4,88	1	3,33
Somatic Symptom Disorder	3	7,32	2	6,67
Attention-Deficit/Hyperactivity Disorder	1	2,44	0	
Obsessive-Compulsive Disorder	1	2,44	0	

The last cognitive domain assessed was language, with confrontational naming evaluated using the BNT. This test score was only available for the patient groups. According to pairwise comparisons, no significant difference was found between the two groups ($t = 0.07$; $p = 0.95$; Table 2).

The final diagnoses, following the psychiatric and cognitive evaluations of the patient groups, were presented in Table 4. According to the results, patients referred from neurological departments (Group 2) showed cognitive decline in only 6 individuals; but half of the group (n=15; 50%) was diagnosed with depression and 6 patients (20%) were diagnosed with generalized anxiety. In contrast, among patients referred from other clinical departments (Group 1), the rate of depression was even higher (n=32; 78.05%).

DISCUSSION

In our study, the neurocognitive test results of patients referred to the CLP for psychiatric assessment from various clinics were retrospectively examined. We aimed to evaluate whether the cognitive complaints of these individuals represented SMC symptoms or an objective presentation of any disorder. This study was designed to test the hypothesis that patients may have forgetfulness complaints besides of neurological conditions and that these may related with psychiatric conditions; significant differences were observed in the performance of the three subgroups of this study sample on forward digit span, semantic fluency, verbal memory (learning, delayed recall, recognition and retrieval) and face recognition tests. Our findings reveal that patients with SMC exhibited distinct neurocognitive profiles depending on the referring clinic. The absence of significant differences between the groups in terms of age and education level indicates that the observed cognitive differences were independent of these variables as suggested with the study by (26) emphasizing that subjective cognitive impairment should be evaluated independently of demographic characteristics.

Forward digit span is a test sensitive to attention capacity (27). It was found that the basic attentional functions assessed with forward digit span in patients referred from neurological sciences (Group 1) and other clinics (Group 2), who exhibited SMC, were significantly lower compared to the control group (Group 3). Several studies in the literature suggest that forward digit span may serve as an early indicator of neurological diseases such as Alzheimer's disease and Parkinson's disease in individuals with subjective memory complaints (28, 29). Additionally, various studies conducted with chronic medical patients demonstrate a relationship between systemic metabolic and vascular effects and attentional impairments in patients. These studies also indicate that the course of attentional impairment correlates with the severity of the disease (12,13,14). Considering our findings in light of previously reported information, this helps clarify the reduction in attention span observed in patients with medical chronicity.

Another executive function, abstraction skill, was evaluated separately at the WMS-R pairwise similarities level and at the proverbs level. No significant difference was observed between the groups in both subtests. Also, in the Stroop Test, which assesses the interference effect among executive functions, no difference was found between the groups in terms of interference time difference and spontaneously self-corrected errors. However, a trend level of difference was observed in the error count between the three groups. This difference emerged specifically in the patient group referred from neurology clinics. It was found that patients referred to psychiatry from neurology had difficulties inhibiting inappropriate responses and struggled when confronted with incongruent stimuli, which is an executive function typically attributed to the prefrontal brain area. Previous studies have consistently shown that the number of errors is higher in neurodegenerative diseases compared to healthy individuals (30,31). Therefore, despite the diagnosis of neurodegenerative disease have yet been concluded, patients with SMC should undergo comprehensive monitoring including psycho-

metric assessments.

Semantic fluency is one of the most frequently used cognitive tasks in the evaluation of executive functions, along with language skills. In this task, it is understood that the temporal cortex, which serves as the reference brain area for the semantic storage, works reciprocally with the prefrontal cortex (inferior frontal gyrus) (32,33). In the semantic fluency test, the performances of patients referred from both neurology clinics and other departments were found to be lower than those of healthy controls. Based on our results, it appears that, regardless of the underlying disease affecting attention functions, semantic fluency is one of the first cognitive function to be affected. However, the significant impairment in the semantic fluency test, in particular, supports the findings of Rabin et al. (34), suggesting that verbal fluency may be a sensitive marker for predicting neurodegenerative processes at an early stage.

Semantic memory, as to roughly conceptualize, consists of stored information about the features and attributes that define a concept, as well as the processes that enable this information to be effectively retrieved and used in thought and language production. Word list learning tests are frequently used in the evaluation of verbal memory, allowing the measurement of all four stages of memory: Registration, learning, retrieval, and recognition. In this study, it was observed that learning ability, as measured by the score obtained from the sum of learning trials and delayed free recall (retrieval) ability, showed significant differences between the groups. Patients referred from both neurology clinics and other departments were able to learn and retrieve fewer words than the control group. The impairments in executive functions related to attention and memory observed in patients referred from neurology clinics are similar to the pre-clinical cognitive impairment pattern described in the study by (35). But patients with SMC differed in one memory component: recognition. When looking at the total recall score obtained by summing the recognition scores with the retrieval scores, it is noteworthy that patients referred from neurology clinics performed more poorly on recognition compared to patients from other departments and healthy controls. It is known that neurological diseases that affect primary brain structures involved in memory processing, such as the hippocampus and frontal cortex, leading to deficits in both short- and long-term memory (36,37). Our findings support the literature and suggest that the memory complaints in consultations from neurology clinics may have a high probability of being related to primary cognitive function loss associated with neurodegenerative processes. Additionally, the exclusion of major neurological diseases in our sample suggests that the observed cognitive impairments may be associated with early-stage or subclinical neurological processes. This approach is consistent with the findings of a previous study proposing that subjective cognitive decline may serve as an important marker in the preclinical stage of neurodegenerative diseases (38).

In evaluating visuospatial skills, both patient groups performed with lower scores on the face recognition test, compared to the control group. This test is attributed to the evaluation of the pathway extending from the occipital to the temporal area, known as the “what pathway” in visual processing. Impairments in visuospatial skills are observed in many neurological diseases, particularly in Alzheimer's disease and other forms of dementia, as well as in conditions like multiple sclerosis, migraines, and tension-type headaches (39,40,41). In a study conducted with Parkinson's patients who had not yet developed dementia and were not depressed, the authors interpreted the fact that this visuospatial impairment became more pronounced as the disease progressed as a strong predictor of Parkinson's disease dementia (42). It is also known that there are difficulties in visuospatial perception in cases of cerebral involvement due to vascular causes (43); therefore, it was considered that vascular deficiencies resulting from systemic diseases could negatively affect BNT performance. The absence of patients diagnosed with dementia in our study sample highlights the importance of CLP evaluations conducted solely based on SMC, especially before the development of dementia, in terms of detecting early symptoms of the disease.

The fact that patients with medical conditions that brain is not the primary disease targeted organ, performed worse on the NPT compared to healthy controls provides valuable data on the complex

relationship between physical health and cognitive function. Our findings are consistent with research indicating that cognitive dysfunction is common among patients with chronic medical conditions (44). The differences observed in our data, as well as in other studies, can be explained by various mechanisms. Some studies suggest that metabolic factors such as uremic toxins, electrolyte imbalances, and cardiovascular complications, as well as medications used in treatment, may impact cognitive function in individuals with physical illnesses (45).

Lastly, reviewing the final diagnoses following psychiatric and cognitive evaluations revealed that depression and anxiety were widespread among patients referred to CLP from both neurological and other clinical departments, while somatic symptom disorder was less prevalent than patients commonly stigmatized in patients. Patients often experience psychological distress in addition to their primary diagnoses, which require psychiatric diagnosis and treatment. However, the impact of these conditions on cognitive abilities is frequently overlooked. Depression is known to contribute to attention deficits with a disruptive effect on memory (46) and as mentioned above, it has even been suggested to act as a precursor to dementia (47). Nevertheless, due to sample characteristics (i.e., multicollinearity) and the limited sample size, performing prediction analysis based on the final diagnoses was not feasible in this study.

Our study has several strengths and limitations. One of the main strengths is that it was conducted in a branch of CLP not widely available in tertiary care institutions in our country, and that a comprehensive NPT battery was used. On the other hand, the relatively small sample size and the absence of long-term follow-up data, as the study was based solely on retrospective records, are limitations that should be considered. Due to the retrospective design of the study, laboratory values for all patients were not accessible; therefore, the impact of metabolic factors such as uremic toxins and electrolyte imbalances could not be examined.

The findings of our study provide important insights into our understanding of SMC and clinical approaches by revealing the differences in NPT performances of patients referred to the CLP division. It should be considered that, in patients referred with complaints of forgetfulness, memory complaints may be related to psychological factors accompanying medical conditions and this may play a significant role in cognitive dysfunction. Additionally, by developing evaluation strategies that vary according to the referring clinical department, personalized assessment models could be created. Future studies should consider longitudinal follow-ups of these patients to investigate in depth the relationship between cognitive changes and clinical progression.

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Cultural self-constructs and help-seeking behavior in mental illness: The Mardin example

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SUMMARY

Objective: This study examines the impact of cultural self-construals in the context of autonomy and relatedness on help-seeking behavior for non-psychotic mental illnesses. Cultural factors shape individuals' perceptions of mental illness and the treatment methods they pursue. Individuals with an independent-autonomous self-construal tend to seek medical assistance, whereas those with an interdependent-relational self-construal are more inclined toward traditional and non-medical methods.

Method: The study was conducted with 80 patients who applied to the psychiatry outpatient clinic of our hospital. Participants completed the Autonomous-Relational Self Scale (ARSS) and the Illness Perception Questionnaire (IPQ). They were categorized into three groups: "medical help-seekers," "non-medical help-seekers," and "those using mixed methods." Data were analyzed using ANOVA and Chi-square tests.

Results: Among participants, 46.2% sought medical help, 36.2% used non-medical methods, and 17.5% used both. The medical group had significantly higher autonomy scores (29.2±4.4) compared to the non-medical (23.3±5.7; $p<0.001$) and combined groups (23.6±7.9; $p=0.002$). In contrast, relational self-construal was higher in the non-medical group (32.2±5.7) than in the medical group (28.0±5.7; $p=0.006$). The main reasons for choosing non-medical approaches were despair (48.8%), personal beliefs (41.9%), and influence from close others (39.5%).

Discussion: Cultural self-construals play a crucial role in help-seeking processes for mental illnesses. Individuals with a relational self-construal tend to be influenced by their social environment and are more likely to turn to non-medical methods. As autonomy levels increase, the likelihood of seeking professional psychiatric support also rises. The findings highlight the importance of cultural psychology in access to mental health services and emphasize the need for healthcare policies to consider cultural sensitivities.

Key Words: Self-construals, autonomous self, relational self, help-seeking behavior

INTRODUCTION

Individuals spend their lives in interaction with social, psychological, and biological events (1). Human behavior is a physical and social function of both the individual and the environment. People, however, vary in the degree of integration with others and the social environment (2). As long as there is open communication between individuals, cultural evolution accelerates. This is because the number of ideas that can be changed or adhered to increases. People are constantly finding out and being influenced by shared ideas. Therefore, understanding human psychology requires taking into account the cultural information that people encounter in their daily lives (3).

Personal, familial, and cultural factors impact the emotions people experience, the meaning of these emotions, and their expression throughout life. Distress is experienced alongside other emotions within a cultural environment. Culture also provides guidance for individuals in experiencing, expressing, and coping with distress. The labeling of the meanings attributed to emotional experiences and their associated physical symptoms as

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"illness" occurs within a sociocultural context (4). Culture affects all aspects of health and mental disorders. This includes perceptions of disorder, explanations, and behaviors aimed at relieving illness or alleviating suffering (5). Help-seeking behavior for mental illness is influenced by factors such as the severity and duration of the disorder, ease of access to healthcare, gender, age, marital status, educational background, an individual's cognitive schemas, cultural background, and religious belief systems (6,7,8).

Throughout generations, human societies worldwide have sought solutions to various health problems through trial and error. In this historical process, malpractices and misbehaviors have given way to more rational and healthy methods through cultural evolution (4). In recent years, societal attitudes toward mental health help-seeking and mental health treatments have shown some evidence to become more positive. Studies of societal attitudes have denoted increasing approval of both psychiatric medications and psychotherapy in Western industrialized countries (9). Nevertheless, there are also studies suggesting that supernatural powers are already being attributed to mental illnesses in various cultures (10, 11). In Anatolia, various beliefs adopted at different periods were widely perceived and applied as traditional remedies for treating mental health problems. The effects of this historically persistent attitude on help-seeking behavior can still be seen today. In our country, patients seeking help from non-medical healers or priests, particularly for psychiatric illnesses, are often observed. In rural areas, patients primarily seek non-medical methods (12).

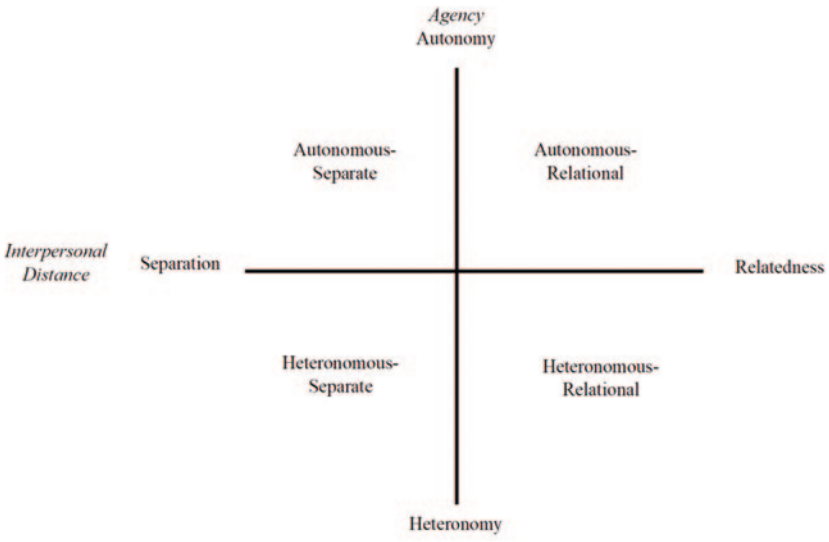
“Self” can generally be considered as a “structure” that is effective in the regulation of behavior and the organization of affective and cognitive processes, and as a dynamic “process” shaped by the interaction of the individual with his or her social environment (13). Cultural psychology argues that the process of becoming a self develops as people interact with their cultural environment and derive meaning from this environment. This process leads to differences in self-concepts across cultures (3). However, with the increasing impact of globalization, cultures are also beginning to resemble each other. Different response patterns in self-descriptions suggest that there are at least two different ways in which people conceptualize their self (3). According to this dual perspective, the development of self-construal in a culture develops either in the direction of individualism or collectivism (14). In the “individualistic culture” individual development, freedom, individual success, individual expectations, and individual happiness play a crucial role in the formation of the “autonomous” self-construal; in the “collectivistic culture” the group’s perspective, group continuity, dependence on the group, group support, group happiness, and how one’s own roles affect the group play an important role in the formation of the “relational” self-construal (3,13,15,16).

Today, in many Western countries, it is assumed that individuals should detach themselves from relationships with other people as much as possible to maintain their independence and self-discovery. In Eastern cultures, however, the crucial factor is maintaining interpersonal connectedness. In these cultures, individuals must play appropriate social roles within society, act in a way that meets the expectations of the group they belong to, and be able to understand the perspectives of individuals within the group (13).

Kağıtçıbaşı's Autonomous-Relational Self-Model, which addresses this theoretical dichotomy more flexibly, argues that an individual can possess both autonomous and relational orientations simultaneously. According to Kağıtçıbaşı, the self has two distinct yet related dimensions: agency and interpersonal distance. As the interpersonal distance dimension varies between relatedness and separation, the dimension of agency varies between autonomy and heteronomy. These two dimensions cannot be completely separated from one another; rather, their combination results in four different self-styles. These are autonomous-separate, autonomous-relational, heteronomous-separate, and heteronomous-relational self-construals (Figure 1) (14,17,18).

In the autonomous-separate self-model, autonomy and self-sufficiency are at the forefront. However, the need for relatedness is not sufficiently met in this model. Individuals with a heteronomous-rela-

Figure 1. Self-styles in the context of agency and interpersonal distance



tional self-model have grown up in traditional families with a focus on the utilitarian value of the child. In this model, the need for autonomy is not sufficiently met. The heteronomous-separate self is pathological because neither the needs for autonomy nor relatedness are met. The self-construal that appears to be the most psychologically healthy is the autonomous-relational self-construal. In regions with high socioeconomic status, the autonomous-relational self emerges in a family model where intergenerational ties are diminished yet emotional attachments persist (14,19,20).

This study aims to understand how self-construals, a key determinant of culture, shape the help-seeking behaviors of individuals experiencing mental distress. In the Mardin sample, where the local cultural structure is thought to have more collectivistic characteristics, we investigated the distribution of individuals' self-construals between professional medical help and traditional help-seeking. We hypothesize that as the autonomous self increases, the likelihood of seeking psychiatric support increases, while as the relational self increases, the likelihood of seeking non-medical methods increases.

METHODS

Research Group

The study included 80 literate volunteer patients, presented to our hospital's psychiatric outpatient clinic between October 1, 2024, and January 1, 2025. Patients presenting to the outpatient clinic were consecutively enrolled as long as they met the inclusion criteria. No patient refused to participate. In the planning stage of the study, the autonomy score of the medical group was anticipated to be higher than that of the other groups, and the medical group's autonomy score was predicted to be 4 points higher than the other two groups. A power analysis based on these data showed that a minimum of 14 subjects in each group was required to achieve a 4-point difference between the medical group and the other groups, assuming alpha =0.09 and power (1-beta) =0.80.

The patients participating in the study were diagnosed by a psychiatrist using the SCID-5, adapted to the DSM-5 diagnostic criteria. Patients with psychiatric disorders due to general medical conditions, alcohol and/or substance abuse, mental retardation, and dementia were excluded from the study. Individuals with chronic illnesses that impair judgment, such as bipolar disorder, schizophrenia, and schizoaffective disorder, were excluded from the research since their illness perception, explanation, and help-seeking behaviors may differ. Comorbid cases were excluded as they were thought to alter the meanings attributed to the illness. Participants were divided into groups based on their responses to the fourth question of the Illness Explanatory Model Questionnaire, which is "What practices have you previously used for your

complaints?". Those who selected either a psychiatrist or other non-psychiatric doctors were included in the "medical" group whereas the groups were assigned by including those who chose the options "I convinced myself, I did not seek a cure, I went to a healer (hodja, shrine, amulet, entombed saint), I resorted to herbal medicine, I used folk medicine practices (lead casting, leech therapy), I did not seek a cure, I meditated" and others in the "non-medical" group, and those who chose both options in the "mixed" group. Ethics committee approval was obtained from Mardin Artuklu University Non-Interventional Research Ethics Committee with decision number 2024/9-3.

Data Collection Tools

Sociodemographic Data Form: Information on demographic characteristics such as age, gender, and socioeconomic status of the participants in the study was obtained through the sociodemographic data form.

Autonomous-Relational Self-Scale (ARSS): This scale, developed by Kağıtçıbaşı to measure self-construals, consists of 27 items, with nine items in each scale measuring relational self, autonomous self, and autonomous-relational self. Participants are asked to evaluate the items on a scale of 1 to 5, from 1 (Strongly Disagree) to 5 (Strongly Agree). Some items are reversed to increase the precision of the results (14). The scale can be used in different ways depending on the researchers' purpose. The total score obtained from each scale provides information about a person's relational self, autonomous self, and autonomous-relational self. On the other hand, by considering the relational self and autonomous self scales separately, insights can be gained into four self-characteristics: autonomous-relational, autonomous-separate, heteronomous-relational self, and heteronomous-separate based on scores above and below the average. In this study, the method most appropriate for answering the research questions was used.

Illness Explanatory Model Questionnaire (IEMQ): The IEMQ was developed by Ünal and colleagues using Kleinman's Illness Explanatory Model (21). The questionnaire includes 10 questions that explore the patient's recommendation for seeking psychiatry, the causative factor for the mental illness, the reason for the current onset of the illness, the procedures the patient has previously applied to, how she/he would seek treatment if a family member were ill, what other members of their circle would do if someone in their circle were ill, what treatment they desired, their expectations from treatment, their fears about the outcome of the illness, and, if so, why they sought non-medical interventions. Patients were informed that they could choose one or more answers for each question. Each question in the questionnaire includes an "other" option for answers other than those listed. In our study, we included the fourth question of the survey, which practices the patient had previously consulted, and the tenth question, the reason for seeking non-medical care, if so, for non-medical care.

Data Analysis

Data analysis was conducted using SPSS 22.0. Quantitative variables were presented as mean ± standard deviation, while qualitative variables were presented as numbers and percentages. Data normality was tested using the Kolmogorov-Smirnov test. Age, gender, marital status, education, employment status, socioeconomic status, psychiatric medication use, history of psychiatric illness, family history of psychiatric illness, and autonomous-relational scale scores were compared among participants in the Medical, Non-Medical, and Mixed groups. The Chi-square test was used for qualitative variables, and both ANOVA and Kruskal-Wallis tests were used for quantitative variables. Tukey and Bonferroni analyses were used for pairwise comparisons to assess significant results between groups. Descriptive statistical analysis was conducted for the reasons for seeking non-medical care. A p-value of <0.050 was considered statistically significant.

RESULTS

Of the participants in our study, 37 (46.2%) were in the medical group, 29 (36.2%) in the non-medical group, and 14 (17.5%) in the mixed group. Fifty-five (68.7%) of the participants were female, and

Table 1: Comparison of groups in terms of clinical and sociodemographic characteristics

	Non-medical	Medical	Mixed	p
	n (%)			
Gender				
Female	16 (55.2)	28 (75.7)	11 (78.6)	0.139
Male	13 (44.8)	9 (24.3)	3 (21.4)	
Marital Status				
Married	19 (65.5)	21 (56.8)	4 (28.6)	0.071
Single	10 (34.5)	16 (43.2)	10 (71.4)	
Educational Status				
Primary School	9 (31.0)	16 (43.2)	3 (21.4)	-
High School	11 (38.0)	14 (37.8)	5 (35.7)	
University	9 (31.0)	7 (18.9)	6 (42.9)	
Socioeconomic Level				
Below 17,000 TL	16 (55.2)	18 (48.6)	7 (50.0)	-
17,000 TL and above	13 (44.8)	19 (51.4)	7 (50.0)	
Employment Status				
Employed	12 (41.4)	15 (40.5)	6 (42.9)	-
Unemployed	17 (58.6)	22 (59.5)	8 (57.1)	
Psychiatric Disorders				
Depression	14 (48.2)	10 (27.0)	8 (57.1)	
GAD	11 (38.0)	16 (43.2)	3 (21.4)	
OCD	0 (0.0)	1 (2.7)	1 (7.1)	
Social phobia	0 (0.0)	1 (2.7)	0 (0.0)	-
Panic disorder	2 (6.9)	3 (8.1)	1 (7.1)	
Conversion disorder	2 (6.9)	3 (8.1)	1 (7.1)	
Hypochondriasis	0 (0.0)	3 (8.1)	0 (0.0)	
Psychiatric medical use				
Yes	15 (51.7)	28 (75.7)	8 (57.1)	0.113
No	14 (48.3)	9 (24.3)	6 (42.9)	
Previous psychiatric history				
Yes	11 (62.0)	22 (59.5)	7 (50.0)	0.222
No	18 (38.0)	15 (40.5)	7 (50.0)	
Psychiatric history in the family				
Yes	10 (34.5)	19 (51.4)	8 (57.1)	0.263
No	19 (65.5)	18 (48.6)	6 (42.9)	

p<0.050

twenty-five (31.2%) were male. No statistically significant differences were found between the non-medical, medical, and mixed groups in terms of gender, marital status, psychiatric medication use, previous psychiatric history, and family history of psychiatric illness (p=0.139, p=0.071, p=0.113, p=0.222, p=0.263, respectively) (Table 1).

The mean age was 35.2 years for the non-medical group, 37.6 years for the medical group, and 28.7 years for the mixed group; no statistically significant differences were found. Considering comparisons of the groups' autonomy, relatedness, and autonomous-relational characteristics, the medical group was found to have a more autonomous self-concept than both the non-medical group (p<0.001) and the mixed group (p=0.002). Similarly, the medical group was found to have a less relational self-concept than the non-medical group (p=0.006) and the mixed group (p=0.012). No difference was detected between the non-medical and mixed groups in terms of autonomous (p=0.973) and relational (p=0.902) self-concepts. The medical group also had a higher autonomous-relational self-concept than the non-medical group (p<0.001) and the mixed group (p=0.001) (Table 2).

Table 2: Comparison of groups in terms of age and scale scores

	Non-Medical[1]	Medical[2]	Mixed[3]	p[a]	Pairwise Comparisons
	Mean (SS)				
Age	35.2 (13.5)	37.6 (13.5)	28.7 (8.2)	0.093	-
Autonomy	23.3 (5.7)	29.2 (4.4)	23.6 (7.9)	<0.001	1;2 p<0.001 1;3 p=0.973 2;3 p=0.002
Relatedness	32.2 (5.7)	28 (5.7)	33 (5.1)	0.002	1;2 p=0.006 1;3 p=0.902 2;3 p=0.012
	Median (Min-Max)			p[b]	
Autonomous-Relational	27 (20-44)	37 (26-41)	32 (24-44)	<0.001	1;2 p<0.001 1;3 p=0.107 2;3 p=0.001

SD: Standard Deviation; [a]: p value for ANOVA test; [b]: p value for Kruskal-Wallis test; p<0.050. Tukey and Bonferroni analyses were performed in pairwise comparisons to evaluate significant results between groups.

Table 3: Descriptive statistical analyses for reasons to apply to non-medical practices

	n (%)
Helplessness and hope	21 (48.8)
Personal belief	18 (41.9)
Guidance from relatives	17 (39.5)
Traditions	12 (27.9)
Curiosity	7 (16.3)
Media guidance	3 (7.0)
Economic reasons	3 (7.0)
Difficulty accessing healthcare	3 (7.0)
Attitudes of healthcare professionals	1 (2.3)
Distrust of doctors	1 (2.3)
Failure of medical treatment	0 (0.0)
Benefits from non-medical practices	0 (0.0)

Regarding the reasons for applying for non-medical practices, participants were determined to resort to these practices mostly out of helplessness and hope (48.8%), followed by personal belief (41.9%), guidance from relatives (39.5%), and traditions (27.9%). As none of the participants selected the options of benefiting from non-medical practices and the ineffectiveness of medical treatments, one participant each chose the options of distrust of doctors and the attitude of healthcare professionals (Table 3).

DISCUSSION

The process of "understanding" is crucial for providing psychiatric assistance to individuals' various biopsychosocial problems, distress, and suffering. Due to the dominance of biological paradigms in the psychiatric field, the social factors that influence the pathogenesis, course, and chronicity of mental illness, as well as the social, cultural, and economic contexts of the illness, are often overlooked (4). An individual who recognizes their mental distress goes through several stages before seeking psychiatric help. During this period, they first develop a causal explanation to gain control over the process. They may externalize the symptom they are experiencing by attributing it to causes outside of themselves, or internalize it by thinking something is wrong with their body. They may mentalize the symptom by attributing it to a psychological process, such as boredom or anger at someone. Based on their explanation, they begin to seek a solution for their complaints and, after several attempts, consult a mental health professional (21).

In this study, conducted to reveal how cultural self-construals shape individuals' help-seeking behaviors for mental illnesses, individuals with an autonomous self-construal were found to tend to seek medical help more, while those with a relational self-construal preferred non-medical interventions. Socioeconomic factors had no significant effect on help-seeking behavior. This demonstrates the influence of social and cultural values on help-seeking processes. A study conducted in India found that more than half of patients, regardless of socioeconomic status, sought help from religious healers for mental illnesses (22). Considering a study conducted in the Himalayas, 39% of patients preferred a psychiatrist as their first choice, while 34% preferred religious healers (23). A study conducted in 2001 found that less than 40% of individuals sought any professional help within the first year after the onset of a mental illness, and the number of those seeking help from a mental health professional was around 11% (24). Regarding a study carried out in 2001 in our country, 32.5% of patients were initially determined to seek professional help for their mental health problems (21). Based on our study, regardless of the duration, 46.2% of participants initially sought professional help following their mental health complaints. There are, nevertheless, studies indicating that public attitudes toward mental health treatments have become more positive in recent years (9), but seeking professional help for mental health is not yet at the expected level.

The social influence of an individual's immediate circle can be a significant factor in the decision to seek professional help. Regarding people's decisions to seek medical help, 50% of those applying for medical services have been determined to do so upon the recommendation of a relative. Similarly, researchers have asserted that those closest to an individual play an influential role in whether or not they seek mental health care when experiencing distressing symptoms (25).

Culture influences many aspects of professional help-seeking, including problem description and attribution, help-seeking decisions, and evaluation of various coping resources. In particular, disparities in relationship patterns across cultures influence the likelihood of seeking help from professionals. Numerous studies on professional help-seeking suggest systematic differences in the fre-

quency of help-seeking among people from various cultural contexts. Ethnicity and modernity, which are both elements of culture, have a significant impact on help-seeking behaviors (26, 27).

Culture-influenced self-construal also influences help-seeking behavior. Research indicates that communal cultures generally exhibit stronger stigmatizing attitudes toward mental disorders than individualistic cultures. A study of 305 individuals from four different cultural groups living in the United Kingdom found that stigma toward mental disorders was higher in collectivistic cultures, as positive attitudes toward mental disorders were higher in individualistic cultures (28). Similarly, a study of African Americans found that an individual with a higher sense of community was associated with greater fear of stigma and a tendency to conceal oneself (29).

According to Kim and Omizo, traditional Asian Americans have a negative attitude toward professional mental health treatment since they believe that expressing psychological problems brings shame to the family (30). The fact that people of East Asian descent are less likely than Americans to perceive their personal problems as significant enough to seek professional help suggests that this may be related to the prevalence of individualism in the United States and collectivism in East Asia (31). Similarly, a study of 88 American and 95 South Korean university students detected that individuals with individualistic self-construals were associated with more positive attitudes toward seeking professional help (32).

Considering a study conducted in the Philippines, cultural factors such as shame, stigma, and collectivist beliefs were identified to prevent individuals from seeking help from mental health professionals, and these factors lead to a preference for folk healers for the treatment of mental illness (33). Considering our study, those with a high autonomous self-construal were more likely to seek medical help. In contrast, those with a relational self-construal were more likely to seek non-medical treatment.

In communal cultures, health is considered a consequence and a resource of a well-functioning group, rather than merely an individual entity (5). Seeking help from an external source, such as mental health professionals, can be viewed as disrupting the harmony within the group or disrupting family balance. Given the relatively strong values placed on family obligations, a family member's illness is viewed as a potential disruption to family stability, leading to the individual's decision to seek help becoming a family decision. Furthermore, in communal cultures, disclosing problems to professionals can be interpreted as a result of dysfunction in the internal group, which can discourage individuals from seeking professional mental health help (26). As individuals with strong family ties may take longer to seek medical help, they trust their support systems and are more open to family members' guidance. Those with an autonomous self-construal may be more likely to seek professional help because they view their own health as an individual responsibility.

Regarding our study, helplessness and hope (48.8%), and personal beliefs (41.9%) were cited as reasons for seeking non-medical methods. A study conducted in Nepal indicates that individuals primarily prefer to seek help from religious healers due to their widespread trust in religious healers, their accessibility, and the persistent belief that mental illnesses are rooted in supernatural causes (34). In the research carried out in 2011 with 135 psychiatric patients on help-seeking behavior, similar to ours, the most common reasons for seeking non-medical help were helplessness, followed by hope, followed by personal belief. In the same study, 7.4% of patients cited distrust of doctors as the reason for seeking non-medical help; however, this rate remained at 2.3% (35). This may indicate that patients' trust in doctors has increased over the past 15 years. Patients may be "seeking non-medical solutions for problems that modern medicine cannot solve". In some psychiatric disorders (e.g., depression, anxiety disorders), patients may seek alternative methods since their symptoms do not immediately improve with medical treatment. As patients tend to explain their symptoms within a spiritual/religious framework, non-medical methods may be sought.

As well as the current study is one of the few stud-

ies to examine how self-construals, along the axis of individualism and collectivism, relate to psychiatric referral processes using a local sample, it does have some limitations. First, due to the relatively small sample size, the generalizability of the findings is limited. Conducting future studies in larger and more diverse sociocultural contexts will help to more comprehensively evaluate the results. Second, the data collection method used in the study is predominantly quantitative, and it would be beneficial to also utilize qualitative research methods to more deeply examine participants' individual experiences and motivations during the help-seeking process. The cross-sectional design of the study precludes tracking changes in help-seeking behaviors over time.

In further studies, it may be recommended to comparatively study the relationship between self-construals and help-seeking behaviors in various sociocultural contexts and to investigate the psychological and social mechanisms behind help-seeking behaviors through detailed narratives of individuals' help-seeking processes using qualitative research methods. Longitudinal studies could also be conducted to observe changes over time, exploring how cultural influences evolve in individuals' mental health care referral processes.

Ultimately, help-seeking behavior for mental disorders is a complex process that combines cultural, social, and psychological factors. Our study investigated that individuals with a relational self-concept tend to turn to non-medical methods under the influence of family and the environment, and that as their level of autonomy increases, their likelihood of seeking professional psychiatric support increases. The findings of this study further underscore the significance of designing health policies and mental health services that consider cultural differences.

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Why psychoanalysis failed to embrace dialectics: Pathways for progressive change through implicit psychotherapy - Part II

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SUMMARY

This paper, the second of a two-part essay, delves into the implicit and immediate factors within psychotherapy, positioning estrangement from oneself and to the environment as a core psychopathological issue. Implicit Psychotherapy, as proposed and outlined in this paper is the technical aspect of Dialectical Dynamic Therapy (DDT), which itself is rooted in the Dialectical Discourse. Aiming for the most profound "healing" possible, this approach directly engages the symbolic network of the mind to minimize resistance to change. The individual obstacle in this process is highlighted as escape from oneself driven by traumatic memories. The subtle and encrypted communication between patient and therapist serves to protect both the individual's unique essence and the purity of the therapeutic process from the external symbolic impositions, which is the second obstacle in treatment. Finally, this approach facilitates the Hegelian process sublation (Aufhebung) of the power dilemma which is inherently linked to trauma. The essay explores a novel "digital brain" model of mind, and the internal moderation concept, highlighting their potential contributions to machine learning applications which would serve for exploration of the opportunities embedded in Implicit Psychotherapy. The development of a Symbol Relations Theory remains as the next theoretical task following this essay which would complete the full set basic knowledge which the proposed psychotherapy approach is to be grounded upon.

Key Words: Implisit psychotherapy, symbol relations, encryption, dynamic, dialectic

Dedicated to my late wife, Psychiatrist İlknur Özütemiz-Şar, MD, with heartfelt gratitude, love, and respect

A t-shirt mocking psychotherapists humorously claimed: "We treat problems you aren't aware of, in ways you don't understand". This sentiment echoes the remark made by one of the author's young patients: "If I caught what you are trying to do with me, I would resist!" Reflecting on such dynamics, the author's extensive clinical experience with a large number of patients previously deemed resistant to treatment has led to practice psychotherapy in a rather subtle, understated way. Unfortunately, this style clashes with principles of marketing, as illustrated by a refund request, claiming that the author hadn't conducted a proper session, but merely engaged in a one-hour conversation! Indeed, clients often expect concrete interventions, yet more nuanced methods may not always appear tangible.

What is overlooked in this exchange is the psychotherapist's role as an advocate for the patient, rather than simply functioning as a service provider attending to a customer (M. Şar, JD, personal communication, September, 2018). The very act of seeking psychotherapy establishes an implicit proxy relationship with the clinician that ethically justifies the therapeutic intervention, regardless of how overt or subtle it may be. At times, this relationship requires the psychotherapist even to challenge the patient's will, particularly to prevent overt or covert self-destructive behavior, as well as to disrupt the evolutionary given algorithmic persistence inherent to any (dis-)order itself. French psychiatrist and psychoanalyst Jacques Lacan even suggested that the desire of change is to be expected from psychotherapist but not from patient. This sentiment was exemplified by an incident, where the older sister of a patient, perhaps misinformed about the session, angrily called the author and demanded: "Why didn't you say what my brother expected to hear?"

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A more critical concern is that a fully declared treatment plan can resemble a rigid contract, traditionally more appropriate for a legal context. Cloaked under the guise of transparency, such agreement would eliminate the flexibility ("Spielraum", playground) necessary for meaningful interaction between the two parties, potentially reducing the relationship to a struggle for control. This dynamic would ultimately lead to a therapeutic breakdown. Drawing the terminology introduced in the first part of this two-part essay, which is rooted in Hegelian dialectics (1), this battle cannot be won by the master (psychotherapist), as their fate lies at the hands of the slave (patient). However, while the slave might emerge as the overt winner in this dynamic, they paradoxically become the covert looser, mirroring a Pyrrhic Victory, as their own fate remains dependent on the psychotherapist.

Thus, in psychotherapy, to challenge the sentiment from Swedish group ABBA's 1980 hit, it is not true that "The Winner Takes It All". Setting aside legal theory and concerns about a romantic affair, insights from quantum physics offer a clearer explanation for the harm excessive control may cause. In quantum mechanics, outcomes are probabilistic rather than deterministic, with systems existing in superposition of possibilities until measured. Moreover, much like the Schrödinger's cat, the observer and the observed are inextricably linked, in this case, the relationship operates in a bilateral manner.

The supremacy of spontaneity: How to pursue an "organic" style

Spanish painter Salvador Dali succinctly expressed the value of originality, when he said: "The first man to compare the cheeks of a young woman to a rose was obviously a poet; the first to repeat it was possibly an idiot". Spontaneity—acting or responding in a natural, unplanned, and unfiltered manner—can be a powerful tool in therapeutic settings. The most profound therapeutic changes often come from those moments when both the psychotherapist and client are most present, unguarded, and responsive to the unfolding dynamics of the session. (2,3). Spontaneous actions or reactions can be seen as more authentic, as they arise without the constraints of overthinking or excessive self-monitoring. This authenticity can help build trust and rapport between the psychotherapist and the patient. Many therapeutic techniques aim to break habitual thought and behavior patterns, with spontaneity serving as a means to disrupt these patterns. As an example from the psychoanalytic tradition pointing in this direction, Wilfred Bion's concept of working "without memory or desire" also emphasizes the psychotherapist's openness and receptivity during sessions. Bion advocated entering each session without preconceptions, expectations, or attachment to prior sessions or desired outcomes. This approach is expected to allow the psychotherapist to remain fully present, and responsive to the patient's needs as they emerge in real time (4).

On the other hand, such "practice-based evidence" (5) does not imply that the clinician navigates uncharted waters without any tools or equipment. The author, while driving through the narrow and winding roads of magnificent Istanbul, a de-centralized histori-city, with their guest North American psychiatrist, psychoanalyst, and hypnotherapist Rick Kluft, remarked in bitter-sweet frustration: "Every day, when driving, I find myself on a new street". Though the guest did not respond verbally, their meaningful smile revealed the wisdom of an experienced psychotherapist! The essence of this idea was echoed by one of fresh psychiatry residents of the author during supervision, though from an opposing perspective. The young physician offered advice to a patient who metaphorically complained of "repeatedly ending up in a familiar destination despite taking a fresh route each time" by suggesting, "try to discover a fresh destination each time by taking familiar routes!" (U.D.Erarslan, MD, personal communication, September, 2024).

Swedish regisseur Ingmar Bergman eloquently emphasized the importance of bypassing the intellect to directly engage the imagination and feelings of a person while describing film's ability to immerse viewers in a natural and instinctive experience. He stated (6): "When we experience a film, we consciously prime ourselves for illusion. Putting aside will and intellect, we make way for it in our imagination. The sequence of pictures plays direct-

ly on our feelings. Music works in the same fashion; I would say that there is no art form that has so much common with film as music. Both affect our emotions directly, not via the intellect. And film is mainly rhythm; it is inhalation and exhalation in continuous sequence".

In psychotherapy, maintenance of this illusion requires being both serious and playful. Indeed, humor operates in a double manner, creating impact by juxtaposing intellect with emotion, leading to moments of surprise and cognitive dissonance with an almost bodily felt relaxation, release, and relief. An adolescent, who appreciated the author's risky macabre humor, referred to it as a "trauma joke", kind of dangerous endeavor if not handled with care. Spontaneity, while powerful, can be unpredictable, posing challenges for both the psychotherapist and the patient including transition to a laissez-faire, laissez-passer approach. It demands a high level of skill and confidence from the psychotherapist to navigate uncharted waters effectively. If not carefully managed, spontaneous actions or statements might be misinterpreted, leading to confusion. Thus, the well-intended spontaneity requires to be completed by goal-directedness, a topic to be elaborated upon in later sections of this essay.

Honoring Marx and Kafka: A paradigm shift

Karl Marx and Franz Kafka shared the common ground while writing on the estrangement of the individual, perhaps foreseeing the core psychosocial characteristic of the forthcoming era: "The Century of Self" (7). In one of their parodies, Turkish comedian Cem Yılmaz impersonates an American criminal defense attorney addressing a jury, declaring, "This person you see before you, is not who you think you know!" The approach of the author to their psychiatric patients is similar! The author posits that estrangement from oneself and/or one's environment is central to a large spectrum of psychopathology, particularly those rooted in developmental trauma. Such adversities often begin in early life, potentially as early as the prenatal period, or may even be transgenerational (8). This early imprint of psychopathology can become indistinguishable from the person's essence, leading individuals to unknowingly identify with their acquired deviation. Reflecting this idea emerging from a different starting point, a late Turkish psychiatrist once shared a seemingly spiritual insight, which in fact, emphasizing the distinction between nature and nurture, stating, "The soul/psyche cannot become ill; it's the mind that falls sick" (A. Songar, personal communication, November, 1989).

A cartoon humorously captures a woman who responds to the compliment "I like your personality" with "thank you, it's a disorder!" Distinguishing between one's inherent constitution and acquired deviations may be impossible if the latter occur early in life, as observed in patients who often lack meta-awareness of the trauma-related aspect of their dysfunction. Making them aware of their hidden dividedness, if conducted in a safe environment, can lead to an empowering "Aha-Erlebnis"-an insight that is both intellectually and emotionally felt. This recognition, the first step of DDT, is akin to repairing a broken DNA strand shown with the opening of the cell membrane. This symbolizes a one time paradigm shift, also in the eyes of the patient, which enhances their receptivity. This intervention alleviates the patient's feelings of shame and guilt about their condition fostering a collaborative dynamic with the psychotherapist. The reframing of the dis-order as an entity of external origin and examining it from a detached perspective, allows the patient to explore their challenges freely, without self-judgement. Paradoxically, this shift in perspective brings the patient closer to their authentic self, rather than enabling an escape from it. What an allegory of nature, that recent studies on bipolar disorder document a special impairment in the repair of broken DNA rather than an inherent shortfall itself ! (9).

"The Great(est) Looser": Traumatic narcissism and escape from oneself

British rock group Queen's "Bohemian Rhapsody" (from the 1975 album "A Night at the Opera") portrays a post-traumatic scenario culminating in dissociative psychosis, poignantly yet paradoxically encapsulated by the line: "No escape from reality". Failure to take ownership of or personalize (assim-

ilate, in Jean Piaget's terminology) reality, if not resulting in amnesia, to a sense of "not me". This is reflected in the timely "egofugal" motto of the 2001 Istanbul Art Biennial (Ş. Eczacıbaşı, B. Pharm., personal communication, February, 2000), and is well-articulated in a New York Times column written by a philosopher who, co-incidentally, also happens to be a boxing trainer (10). Kierkegaard's philosophy suggests that denying oneself leads to despair, while accepting oneself often results in depression. Depression often emerges in post-integrative stages of psychotherapy, as the individual confronts the weight of their reconciled self and past.

The internal world not only mirrors external reality but also compensatory responses to suboptimal stimuli (11) such as developmental trauma caused by unreliable caregiving. This can foster omnipotent self-aspects aimed at maintaining control and need for self-sufficiency, a hallmark of traumatic narcissism (12). These inner entities act as buffers against vulnerabilities like rejection sensitivity. Rather than being imported from the outside world, they are created through the self-modification of itself (13). The appearance of strength created by a ghetto-like closed system (13,14) of buffer entities masks an underlying weakness in the self which differs from true self-sufficiency. The façade of coherence, while functionally adaptive, places a significant burden on the individual to sustain a consistent narrative about reality and self-identity. In conditions when this façade is threatened, discontinuities may become manifest. Dividing the external world may be utilized as a way of coping which is usually considered as a clue of BPD. The effort to maintain interpersonal relationships despite underlying fragmentation can result in rejection sensitivity and fears of abandonment.

Research indicates that vulnerable type of narcissism, unlike grandiose narcissism, is linked to preoccupied attachment but not to other types of childhood trauma or dissociation (12). Like in grandiose (compensatory) narcissism, vulnerable status requires reliance on self-objects to sustain fantasies of perfection (15). When a secure relationship fails, it can lead to depression and a defensive cycle of grandiose narcissism, maintained by dissociation (12). This state often manifests as "honorable estrangement" or "dignified resentment" which may progress into nihilism, hopelessness, and loss of vitality. Such individuals may appear resigned to life, having "sifted their flour and hung up the sifter", as a Turkish proverb states. However, this resignation differs from peaceful acceptance of a Zen master, as it arises from disillusionment rather than spiritual fulfillment.

The statement of one of the author's early patients with schizophrenia, describing a self-centered existence, resonated with Dali's "The Great Masturbator":"I lived an earthly life that began and ended with myself". In "The Sickness Unto Death" (16), Kierkegaard emphasized the relational nature of human existence, whether with others or oneself, which is vital for meaning making (17). A narcissistically constructed inner world serves as a coping to reconcile the gap between the imagined (ideal) and actual self, often relying on compensatory grandiosity and folie a deux with selfobjects to momentarily bridge the personal discontinuities. As Erikson (18, p.157) observed: "It is as if the culture had made a man over-advertise himself and so identify with his own advertisement". This inner tension, inherently traumatic and threatens self-esteem, aligns with dissociation. Research shows a positive correlation between grandiose narcissism, depression, and dissociation scores, despite the negative correlations between grandiosity and depression itself (12).

The coexistence of grandiosity and depression, enabled by the trance-logic (19) that aligns opposite realities without conflict, does not create a discord in a dissociated inner (and outer) world. This split is sustained through a vicious cycle between traumatic narcissism and dissociative depression, forming a perpetuum mobile (12). While economically impossible to sustain unless fed from outside, this dynamic serves as a powerful symbol of humanity's relentless pursuit of the unattainable, resonating with Lacan's Imaginary.

Knowing and not knowing: Escape from reality

Dissociation, as a discontinuity of mental functions, including consciousness and memory, involves "unknown known". This is a term derived from for-

mer US Defense Secretary Donald Rumsfeld's statement about decision-making under uncertainty during Gulf crisis ("unknown unknown" as an alternative to "known known"), later reinterpreted by Slavoj Zizek (20). This concept illustrates how the information relegated to "parallel-distinct structures" (21) remains inaccessible unless addressed within a secure and supportive environment. The tension between "known" and "unknown" reflects an epistemological challenge, aptly captured in the title of a psychoanalytical journal's epilogue on dissociation (22): "The formidable human need to "not know". Zizek, again, humorously illustrates this, with a joke: A man believes that he is a kernel of corn, and goes to a psychiatrist who, after several treatments, finally convinces him otherwise. He leaves the office relieved, until he runs into a chicken on the street. He turns and runs back, terrified of being eaten and asks the psychiatrist what he should do. The psychiatrist replies, "But why are you afraid? You know you aren't a kernel of corn!" The man replies, "Yes, but does the chicken know?"

Hegel argued that self-consciousness is the purest form of knowing oneself. Once you know yourself, only then you can attribute qualities to yourself. As you find out about the world around you, the objects in the environment can also contain qualities that you first learned by becoming aware of yourself. This widens the scope of the individual's perception. On the other hand, both internal and social processes often operate to keep us unaware (23). One reason for this lack of self-disclosure is the interconnectedness of the external and internal disclosure. As Freyd and Birrell (23, p.116) state, "To the extent that it is not safe to disclose externally, it is not safe to know, or disclose internally, to oneself." This internal struggle between "knowing and not knowing", as an escape from oneself and/or reality, disrupts the experience of self-identity, including one's relationship with their own body.

Russian philosopher Mikhail Bakhtin (1895–1975) stated that meaning was created through dialogue. As the main carrier of the dialogue, language, for Bakhtin, is inherently relational and dynamic, constantly shaped by its social and historical context (24). To explain this, he created concepts such as heteroglossia (coexistence of multiple perspectives-voices- within a single text each reflecting a different social or ideological position), carnivalesque (a space where traditional hierarchies and norms are temporarily subverted, allowing freedom, creativity, and the inversion of power structures), and chronotope (the way time and space are represented in. narrative, shaping how stories are told and experienced). Focusing on novel and literature, Bakhtin's ideas have not been transferred to the psychotherapeutic practice.

Encryption in psychotherapy (G. Ayas, MD, personal communication, September, 2024) refers to the creation of shared symbolism between patient and psychotherapist, ensuring security and safeguarding the therapeutic space from external intrusions. The encrypted symbolism in psychotherapy is, however, just the opposite of Lacan's Symbolic which is composed of daily reality as adjusted to common needs of the community. The latter is akin to Erikson's concept of actuality representing the reality acknowledged by a significant portion of the community, in contrast of Lacan's elusive Real which signifies a concealed dimension of reality that can only be approached indirectly through psychotherapy. This safeguarding allows the Psychological Selves (25) of both partners to connect securely, mirroring the mathematics of romantic love observed in truly intimate relationships. Such a secure bond enables individuals to experience themselves as unique (occupying the center of the Lacanian Borromean knot)- a fundamental condition for feeling truly alive, as emphasized by Carl Gustav Jung.

Nietzsche's provocative metaphor, "Supposing truth is a woman, what then?" might be replied: "Then it must be seduced" (R.Düren, MD, personal communication, December, 2024). Blending Nietzsche's metaphor and a nuanced perspective on gendered dynamics, this statement suggests that truth, like a woman, must be approached with delicacy, respect, and an understanding of its nuanced nature. That means, truth should not be forcefully possessed but instead "attracted" through an intentional relational process. To be "won over," truth needs a relationship—one of respect, dialogue, and mutual engagement—rather than a unilateral imposition. Traditional philosophers, with their dogmatic and imperialistic quest to possess truth

fail to elicit genuine responses from it. Instead, to offer an answer, truth requires not injury or coercion but reverence, care, and partnership-qualities akin to a valued relationship. In this context, encryption as a metaphor suggests the balance between openness and concealment, where protection does not negate value but enhances it.

Internal world and external reality: A continual back and forth

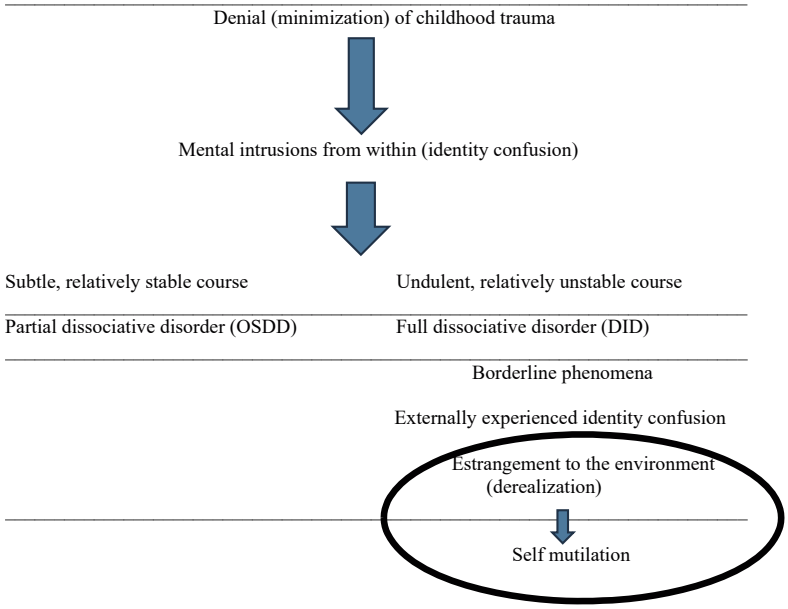
Rumi (1207-1273) is quoted to have said: "I have lived on the lip of insanity, wanting to know reasons, knocking on a door. It opens. I have been knocking from the inside". This aphorism resonates with Australian psychiatrist Russell Meares' legacy (26), who, in his paper titled "A Psyche for Psychiatry", references Karl Jaspers' 1913 observation: «All life reveals itself as a continuous interchange between an inner and an outer world» (General Psychopathology, p.12). Meares builds on this idea, asserting: "Out of this interchange arises the third thing, the experience of myself". He further states: "Unless psychiatric institutions of teaching and research restore to the experiences of 'inner' life the value given to them before the shift in Western consciousness which occurred round 1913, we are in danger of developing and propagating a discipline which is, in a fundamental way, lifeless." A patient, following the author's comment on the merits of establishing (emotional and behavioral) control "from within" (of the person), remembered Rumi's statement in a way that articulated the core principle of Implicit Psychotherapy even more explicitly than the abovementioned original: "I have been trying to open the door from outside, it turns out that it opens from inside".

A comparison of two iconic 20th century science fiction films, Tarkovsky's "Solaris" (1972) and Kubrick's "2001: A Space Odyssey" (1968), reveals contrasting visions during the Cold War era, characterized by the ideological rivalry between USA and USSR. Both films treat space as an existential frontier. Kubrick's work is more outwardly focused, emphasizing human progress and the larger cosmic questions. It presents a future defined by technology and artificial intelligence (AI), embodied by HAL 9000, reflecting humanity's dependence on machines and the potential unpredictability of AI which goes out of control. In contrast, Tarkovsky's work examines into the internal, emotional crisis of the psychologist cosmonaut Kris Kelvin, emphasizing human vulnerability, guilt, and memory. The alien planet Solaris conjures physical manifestations of the cosmonauts' dissociated memories, particularly Kelvin's suicidally (because of his lack of love) deceased wife, Hari, who bodily (live in physical form) reappears in the spaceship as a consequence of his unresolved feelings. Kelvin's journey through space serves as a metaphor for his inner process, focusing on self-confrontation than on exploration.

A study conducted on young adults in Turkey (27-30) revealed significant insights into the relationship between traumatic memories, self-detachment, and the shifting boundaries between the internal world and external reality, as vividly fictionalized in cosmonaut Kris Kelvin's "space odyssey" in Solaris. Denial or minimization of childhood trauma (often coupled with idealization of the perpetrator, particularly in cases involving close proximity) was found to predict mental intrusions from within, representing what may be described as "the return of the dissociated". Descriptively, this manifests as identity confusion leading to non-psychotic Schneiderian experiences, particularly of the passive influence type, in which one feels their sense of agency is compromised, as if being puppeteered or controlled by an internal power (master), reducing the self to a dependent entity (slave). In the study, internally experienced identity disturbance emerged as a shared feature across both BPD and dissociative disorders (DD), suggesting a common ground in this spectrum of psychopathology. In contrast, externally experienced identity disturbances, such as being perceived as a different person, exhibiting sudden anger, or having imaginary companions were more strongly associated with BPD often accompanied by detachment from external reality (derealization) (29).

Thus, having BPD, DD, or both may represent multiple faces of the same coin. The presence of identity disturbance, whether experienced externally, internally, or both, constitutes "Pathway 1" of post-traumatic coping typically associated with a

Table 1: Subtle and undulent courses as post-traumatic pathways of coping

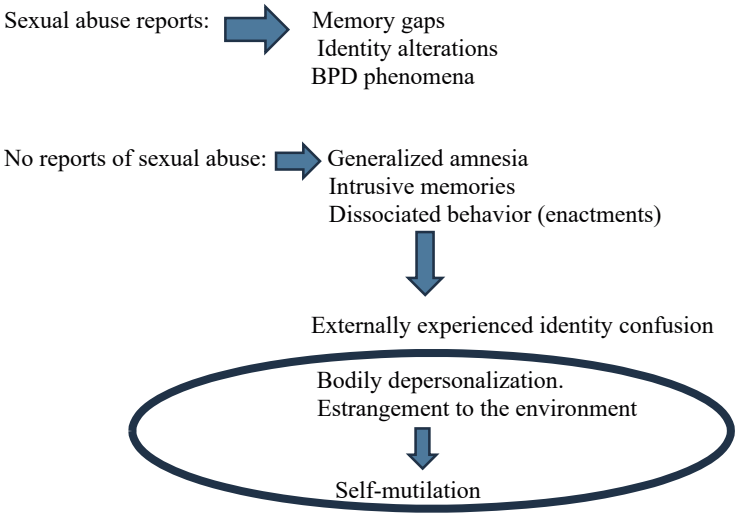


diagnosis of DID, BPD, or both. In contrast to these highly expressive conditions, bodily self-detachment is more often linked to subtler forms of DD, forming "Pathway 2", which does not cover identity disturbance. This duality between expressivity and non-expressivity mirrors but not limited to the distinction between undermodulation and overmodulation of emotions in PTSD, a differentiation increasingly supported by neurobiological research (31). While this understanding of overmodulation and undermodulation informed the inclusion of the dissociative subtype of PTSD in DSM-5, its clinical characterization, centered on depersonalization and derealization, has narrowed the concept of dissociation to that of emotional overmodulation. This framing risks becoming tautological, as it focuses primarily on the negative symptoms of dissociation, thereby excluding its positive or intrusive manifestations. The latter include dissociative hallucinations, sudden surges of "orphan" emotions (i.e. those without an explicit origin) , and sensory-motor phenomena such as psychogenic non-epileptic seizures, now often referred to as functional neurological symptoms, as though they were merely accidental malfunctions of the central nervous system, rather than complex expressions of unresolved psychological trauma (32).

The body: Intimate outsider or extimate partner ?

Why did Kafka's Gregor Samsa wake up one morning as an insect? This is precisely the right moment to explore the body's role in the often silent process (Pathway 2) of coping with trauma-related mental content. The aforementioned study on a college population in Turkey (27-30) revealed intricate connections between childhood trauma, memory, self-identity, and the environment, with the body (itself and/or its image) playing a central role in this dynamics best described as the embodied experience. Reported childhood sexual abuse was associated with memory gaps, identity alterations, and BPD traits which are phenomena reflecting a struggle with conscious mental content. In contrast, the absence of such reports, possibly representing a temporarily successful escape for those who were nonetheless to trauma, was linked to intrusive memories, dissociated behavior, and generalized amnesia which, under stress, may culminate in a nervous breakdown marked by self-destructive behavior and (re)-enactments related to past trauma. While the former pattern aligns with the undermodulated coping style (often seen in florid BPD/DID presentations), the latter represents an overmodulated style, wherein previously inaccessible memories emerge intrusively in individuals teetering on the edge of trauma-related enactment (the return of the dissociated). Notably, this escape-based pattern was closely tied to bodily self-detachment, detachment from external reality, and externally experienced identity disturbance, suggesting that, in some cases, the body becomes both a vehicle for survival and a silent witness to trauma,

Table 2: Reported sexual abuse and absence of sexual abuse reports: Indirect clues of memory impairment and its correlates



encoding that the conscious mind cannot bear to hold. The opposite or positive version is shown as persistent somatic symptoms representing calm before the storm, the latter with the potential of a systemic chaos emotionally or, in a worse case scenario affecting bodily health (33).

Might it be possible, at the risk of overinterpretation, that identity alteration serves as a coping mechanism to shield against the awareness of traumatic memories? Additionally, might bodily self-detachment reflect the psychological burden of not re-membering such an experience? Supporting this speculation, research indicates that reported childhood sexual abuse is associated with cognitive-emotional self-detachment and perceptual detachment, but not with bodily self-detachment (29). Could the body be perceived as an external entity, separate from the internal world, contributing to its perception as an enemy (34) onto which "evil" is projected, potentially betraying the individual through hidden threats like a disease (35)? Alternatively, is the body viewed as one's most vulnerable commodity or asset, fragile to not only against disease but also physical assaults, in contrast to the internal world perceived as the "little town of (positive) possibilities", referencing a Turkish advertisement motto? It seems this is where Descartes' concept of mind-body dualism takes root (!), a perspective that ultimately gives rise to the dissociative notion of the "ghost in the machine" described by British philosopher Gilbert Ryle.

In a study on psychosomatic patients suffering from pain, childhood emotional neglect predicted somatic dissociation (36). In these patients, childhood abuse (rather than neglect) predicted cognitive-emotional dissociation which correlated with the severity of depression. The latter, in turn, predicted expressed anger, which was associated with loss of control, BPD traits, and dissociative amnesia. Loss of control was also related to childhood abuse reports, identity fragmentation, and dissociative absorption. This pattern indicated undermodulation of emotions during crises, often triggered by the release of previously overmodulated anger, possibly triggered by traumatic reminiscences. The abovementioned college study (29) found that such florid conditions, usually accompanied by BPD and DID phenomena, were predicted by higher childhood trauma total scores and reports of abuse, while emotional neglect and denial of childhood trauma predicted relatively subtle (partial) dissociative disorders. Overlap between these patterns was common, though. Both over- and undermodulated states shared dissociative amnesia as a central factor, emphasizing the critical role of post-traumatic memory processing in shaping of clinical symptoms.

The aforementioned college population study in Turkey (27-30) also documented that emotional and physical neglect led to bodily self-detachment and detachment from external reality, both of which have been shown to significantly correlate with self-mutilation. Interestingly, this pattern of

Table 3: Post-traumatic pathways: Subtle (relatively-stable) and florid (undulent) courses in context of memory and identity

OVERMODULATION OF EMOTIONS (Partial dissociative disorder:OSDD)	
↑	
Emotional neglect Minimization of childhood trauma	
UNDERMODULATION OF EMOTIONS (Full dissociative disorder:DID)	
Current severity of depression	
↓	
Reported abuse <→ Loss of control <→ Expressed anger <-→ Dissociative amnesia Identity fragmentation Dissociative absorption	Borderline phenomena

disowning the body was associated with dissociative amnesia but not with other (cognitive-emotional) dissociation measures. Both bodily dissociation and estrangement to the environment seem to be the consequence of overmodulation (restriction) of emotions leading to a subtle or suppressed clinical condition.

In his presentation "Television" (37, p. 6), Lacan emphasized the body's associative role in a detached internal world, stating: "In fact the subject of the unconscious is only in touch with the soul via the body". Lacan argued, language is the medium through which this connection occurs, which explains why psychogenic somatic symptoms align more with cultural stress idioms rather than the body's anatomy. In a similar linguistic context, Jean Laplanche proposed that psychic life is structured through translation but not just repression (4). He argued, from infancy on, children encounter enigmatic messages from adults—especially from caregivers—that are beyond their ability to fully comprehend. These internalized messages remain incompletely understood or translated. Laplanche's theory shifts the focus from repression to the intersubjective origins of the "unconscious" which highlights the infantile origin of dissociation including inter-generational transmission of trauma (8). This notion is similar to Donald Stern's concept of "unformulated experience" which is not repressed because it has never been fully felt (38) or "Lost in Translation" to echo the title of Sofia Coppola's 2023 romantic comedy-drama film.

The author suggests that, even sexuality, as an embodied form of communication, can become functionally disrupted when used to address an individual's inner psychological detachment. This usually occurs in real life through the interference of trauma-related and gendered power dynamics (39), akin to the master-slave conflict discussed in the first paper of this two-part essay (1). In Bob Fosse's "All That Jazz"' (1979), the final scene depicts a meta-physical fusion between the protagonist and his deceased wife as he nears death, symbolizing the departure from the body. This scene closely mirrors the experience of fusion between detached personality states within a dissociated individual, where distinct entities often resist, perceiving this integration as a form of dying, i.e. a threat to their imagined separate existence also bodily. Because of the similar enigmatic situation, a real "fusion" between deeply intimate partners may only occur in the death of one, as it is the body that indicates separateness between two individuals! Thus, passionately intimate partners do not part after death, as captured in the Celine Dion song "Immortality" (1997) featuring The Bee Gees: "We don't say goodbye!"

"How Deep is Your Love?": Ideology everywhere !

In contrast to the plea of the 1977 Bee Gees ballad, which questions security and authentic connection within a relationship, Andy Warhol is said to have remarked: "I am a deeply superficial person". In "Beyond Good and Evil", Nietzsche offered a sharp observation on the illusion of depth: "When

one wants to appear deep and mysterious, one puts on a dark and unintelligible expression. People believe that where there is fog, there must be depth." Indeed, underlying realities may sometimes be more apparent at the surface while apparently deep endevours may build the surface hiding a truth! This is precisely the point, where ideology snakes in and must be critically examined. Ideology operates most powerfully when it presents itself as natural, unquestioned, or simply the way things are, a surface so seemsless and familiar that one no longer think to look beneath it.

For instance, philosopher Slavoj Zizek (40) explores the hidden ideology embedded even in functional forms and objects. As an example, he humorously compares the mechanics of three different bowl shapes, linking restroom architecture to national character while overlooking but the most spontaneous option: the a la Turca toilet! Namely, in typical German toilet, there is a plateau where the "product" lands before disappearing with the flush, allowing time for inspection to think about what has been done. In the French toilet, the hole is positioned on the back so that the output disappears as quickly as possible. The Anglo-Saxon toilet basin, however, is full of water, so that the product freely floats, finding its "value" in the "market" ! In contrast, with the a la Turca toilet, you first take a stable position on a solid ground and relax at the same time, then aim for the hole (if you want it to disappear), and let the product fall. The focus is on reaching or not reaching the goal. Not only the individual to be healed, but the psychotherapist also benefits from an appropriate blend of the four existential stands mentioned above while conducting their professional task.

Zizek links these designs to Hegel's interpretation as expressions of three different existential attitudes: reflective thoroughness, revolutionary hastiness, and utilitarian pragmatism, respectively. Politically, this triad can be seen as German conservatism, French revolutionary radicalism, and English liberalism, each reflecting a different approach to dealing with excremental excess: Ambiguous contemplative fascination; a desire to get rid of it quickly; and pragmatic disposal (40). This framework would gain additional depth by incorporating the Turkish "decisive interventionism" existentially, and arbitrary checks and balances politically, alongside a contagious lack of a structured distance (M.E. Akdemir,MD, personal communication, September, 2024) in relation to excremental excess. This is why Turkish "knowing" is rooted in authentic (self-) experience and doing rather than looking from a distance (except the preparation phase before -but not after- action), which becomes an obstacle when attempting to adopt the "Western" style of communication in "scientific" pursuits.

The author recalls a German mathematics teacher at a Turkish high school in Istanbul. The teacher once responded to the pupils' complaints about the difficult exam questions, which didn't seem to align what he had taught in class and required considerable thought just to achieve partial credit, by saying: "What is the point of asking what I've already taught?" Of course, he was also reluctant to accept shortcut solutions commonly employed in Turkish multiple choice exams with a large number of questions at a time, where speed and accuracy are essential. The rather "organic" concept of hitting (or, alternatively, missing) the target after securing a natural, grounded, and relaxed position, without relying on technical add-ons, resonated with the performance of Yusuf Dikeç, the Turkish Olympic shooter, whose presence at the 2024 Paris Games became a social media phenomenon worldwide.

Hitting the target: "Instant" psychotherapy

The profound entanglement of the body with the inner world, where intimacy, death, and dissociation converge, finds an unexpected analogue in certain therapeutic processes: The phenomenon of sudden transformation. Where lasting change after chronic psychopathology is often credited to sustained therapeutic efforts, there are moments when profound shifts occur almost instantaneously. What a pleasure it would be that an intervention led to immediate resolution (41)! Remarkably, the utopia of such instant psychotherapy may become at times a reality, even without any tangible intervention by the psychotherapist! (J.Osmanli, medical student, personal communication, February, 2025).

Notable initiatives aimed at reducing the treatment

duration have been Habib Davanloo's (Intensive) Short-Term Dynamic Therapy (ISTDT) (42) and Gottfried Fischer's Multidimensional Psychodynamic Trauma Therapy (MPTT). The latter is designed for psycho-traumatic conditions (11), where around 10 sessions can effectively prevent long-term trauma-related disorders. Similarly, Francine Shapiro's (43) Eye Movement Desensitization and Re-Processing (EMDR) demonstrates lasting improvements in PTSD, even post-treatment, unlike pharmacotherapy, whose effects may diminish after discontinuation (44). The success of these approaches is not a merely technical issue. It is rooted in a robust philosophical ground. EMDR, for example, relies on the dialectical interplay of first-person perspectives which are forced to interact. As a historical irony, short-term psychotherapy emerged as an innovation during WWII military psychiatry, when both medical staff and soldiers were forced to navigate the edge of an abyss.

At Salpêtrière, an observer once remarked to the chief physician: "Dr. Charcot, what you say does not fit the theory". The "Docteur" famously replied: "Theory is good, but it doesn't prevent things from existing!" Richard Kluft (45) expands on this statement with a counterpoint: "Things are good, but they do not prevent theory from existing". The interplay between theory and practice reflects the essence of "ideology" often defin, March, ed as a set of beliefs or philosophies held for reasons beyond pure knowledge. In the realm of healing profession, a more precise description of ideology even be more accurate: "Having to practice where theoretical understanding is not complete" (E. Özalp, MA, personal communication, February, 2025). Psychotherapists' preferences for "slow" or "fast" action (46), or the "depth" of their approach often reflect their ideological stance, shaped by broader philosophical, theoretical, cultural, or geographical perspectives on change and healing. Thus, far from being confined to politics, ideology can also influence clinicians' attitudes and choice of methods! Acknowledging its universal presence, rather than ignoring it, is essential to maintaining "neutrality" in psychotherapy.

A Turkish proverb says: "The doctor comes to a patient's door who is destined to heal" . The author's ethical interpretation reverses it: "The patient who is destined to heal comes to a doctor's door". These recoveries, marked by sudden but lasting improvements, are neither coincidental nor mere placebo effects (47). They also cannot be reduced to a transient "flight into health" (19), as many such patients actively choose to consolidate their recovery by "staying where they are" echoing the grounded perseverance found in the lyrics of American country music giant Willie Nelson. These individuals typically require minimal post-recovery support to sustain their mental wellbeing.

This style also reveals its limitations, particularly concerning the protective role of a "synton", a term inspired by Lacan to describe a symptom that serves as a stabilizing mechanism, significantly influencing the pace and outcome of treatment. For example, dissociation, described as a "functional dysfunction" (48), may paradoxically foster resilience by deferring immediate emotional responses and enabling temporary adaptation to overwhelming challenges. This perspective is poignantly embodied in the case of one of the author's early patients, a middle-aged man suffering from a persistent "functional" (dissociative) neurological symptom affecting his gait. Upon recovery, the patient insightfully reflected: "While I was seeking a cure for my suffering, (it turned out that) my suffering was the cure for me". Nassim Nicholas Taleb's (49) concept of "antifragility", not only withstand stress but actually improve because of it, offers a compelling intellectual parallel, highlighting how adversity can sometimes become a catalyst of growth and resilience.

Internal moderation and the digital brain

A quote often attributed either to Steven Covey or Viktor E. Frankl says: "Between stimulus and response there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom." In the author's view, the "on-off" dynamic observed both in symptomatology and treatment response can be best explained by an internal moderation system, one that processes perceived distress as input and generates an appropriate output response, either activating or deactivating, depending on the context. Considering the

still to-be-discovered mysteries of decision-making processes, the author has consistently opposed the concept of impulsivity that implies humans are driven by potentially uncontrollable forces reminding Sigmund Freud's famous statement: "Where id is and there ego be" (50). This perspective neglects the positive and regulative aspects of impulsivity, which allow decisive and swift interventions, when appropriately directed. This is the human mind's "internal moderation" function (51), much like the role of the host mediating a debate.

As a psychobiological self-regulation capacity, internal moderation is hypothesized to mirror the electrochemical functioning of synaptic transmission, operating with a "digital" system with on/off dynamics (52). However, in line with the author's model of simultaneous processing through "parallel-distinct structures" (21), this binary switch mechanism opens the possibility for three concurrent modalities: on (excitatory), off (inhibitory), and dual (ambivalent) modes. Preliminary data suggest that the dual modality represents the current severity of psychopathology as a state measure, independent of the primary diagnosis (52). The simultaneous elevation of three modes often indicates heightened inner tension with the potential for a (self-) destructive enactment (e.g. suicide attempt, self-mutilation, or assaultive behavior) for temporarily relief. A discrepancy between on and off modes, however, does not necessarily mean an imbalance. Simultaneously outlying low scores in all three modes, on the other hand, may indicate "calm before the storm", rather than reflecting the pieceful inner world of a Tibetan Lama! (33).

The on-off (binary) nature of synaptic transmission introduces a digital-like quality to brain function (A. Songar, MD, personal communication, November, 1989). However, this system can also produce graded, analogous responses giving the impression of hybrid functioning. In a similar vein, Daniel Kahneman's distinction between slow and fast thinking systems (46) and Stephen Porges' polyvagal theory (53) emphasize alternative pathways in the human mind and body that support survival. The concept of "emerging property", originating from Aristoteles, refers to characteristics, behavior, or outcomes that arise from complex interactions of system components, producing a function that cannot be explained by examining the components alone. This principle, central to systems thinking, illustrates that "the whole is greater than the sum of its parts" and helps how the brain turns digital processes into analogous outputs. Who knows, if depression and mania in so called "bi-polar" disorder might, at a fundamental level, be the two faces of the same coin as suggested by psychoanalyst Melanie Klein (54), potentially linked to a disturbed internal moderator that regulates the switching between these states.

In the era of the digital brain and artificial intelligence (AI), multidimensional aspects of internal and external communication require to be re-evaluated. Implicit Psychotherapy, as proposed by the author, emphasizes subtle, indirect interventions gently touching critical junctions in the patient's mind, but not all at a time! This aspect has to rely on a yet-to-be-fully-explored "Symbol Relations Theory" (M. Kemaloğlu,MD, personal communication, March, 1983). Unlike signs with fixed meanings, symbols serve as knots and hubs between contrasting signifiers, enabling a deeper "editing" of mind, soul, and body. For instance, white can signify both burial shroud and briding gown, while black can indicate both nobility and grief. While symbolism was deeply included in Carl Gustav Jung's work (55), it has largely fallen out of mainstream psychotherapy, possibly due to its probabilistic rather than deterministic predictability. To address uncertainties, interim assessments of outcome may be a solution. Moreover, resembling the principles of the quantum physics, these assessments themselves, can stabilize the progress as well, if the patient and the psychotherapist agree on a neutral evaluation method. These methods should be relational and grounded in a dialogue between the clinician and the patient as depicted earlier (1).

CONCLUSION

Implicit Psychotherapy serves as the core communicative technique in DDT akin to "free association" in psychoanalysis. Without its ideological foundation, it risks misuse like any "scientific" knowledge. The Dialectical (Healer's) Discourse provides the philosophical grounding and the responsibility remains central to therapeutic prac-

tice. Implicit Psychotherapy is essential for implementing DDT, as it frees the necessary space for Dialectical Discourse. In this framework, the "unconscious" is to be replaced by the concept of "parallel-distinct structures", echoing psychiatrist Hagop Akiskal's approach to the term "borderline" when used the title of a personality disorder : "An adjective in search of a noun" (56).

In the context of a new model of mind, the interplay between the Internal Moderator, the Sociological and Psychological Selves, and the Natural Self (which provides life energy) alongside "free-floating" emotions available to these entities renders the structural hypothesis of psychoanalysis redundant. The Traumatic (Symptomatic) Self (51), with its "resistances", serves as a carrier of clinical symptoms while "crying for help". It paradoxically acts as a rescuer within a detached internal world by building temporary bridges between dispersed entities. This is the cast which the clinician must engage with!

The notion of transference and counter-transference are deemed irrelevant, and sometimes counterproductive, in DDT. Their use threatens the experience of genuineness emerging in "encrypted" communication essential to this therapeutic approach. Spontaneous generation of "passwords" for each interaction ensures encryption to let the Sociological Selves of both psychotherapist and patient bypassed to allow their Psychological Selves to engage directly. Far from being passive, Implicit Psychotherapy is akin to "psycho-surgery", as one of the author's patients termed it, in its precision and invasiveness. Being an interventional approach, Implicit Psychotherapy may range from virtuosity to a less ambitious execution, depending on the psychotherapist's skills. It may be considered as "gold" that may need to be mixed with "copper" to adapt to the context.

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The effect of group psychotherapies on perfectionism: A systematic review

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SUMMARY

Perfectionism is known to be both a risk factor and explanatory mechanism for many psychological disorders and also a barrier to treatment. Perfectionism is considered as a transdiagnostic concept in terms of these characteristics and has led to the development of many interventions to treat different psychopathologies by targeting perfectionism. In the literature, it is seen that in addition to individual intervention approaches that are known to be effective on perfectionism, interventions in group format have also been developed. The aim of this study was to systematically examine the effectiveness of group psychotherapies addressing perfectionism. Method: For this purpose, Pubmed MEDLINE, Web of Science, Scopus, Science Direct, Wiley and ULAKBIM Medical and Social Sciences databases were searched for English and Turkish articles between 2004 and 2024. Eleven eligible studies were included in the systematic review. Results: Results showed that different group psychotherapy approaches (Cognitive Behavioral Therapy, Dynamic Relational Therapy, Mindfulness-Based Cognitive Therapy) were effective in reducing perfectionism in non-clinical samples. However, it was concluded that the treatment protocol should be carefully considered for groups with diagnoses such as obsessive-compulsive disorder and eating disorders. Conclusion: Group psychotherapies can be effective depending on the therapy approach adopted. However, addressing only perfectionism in clinical samples provides a limited approach.

Key Words: Peer support, mental health, social support, mental health services

INTRODUCTION

The field of clinical psychology and psychiatry has historically adopted a diagnosis-focused approach through classification systems such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD), which have provided researchers and clinicians with a common language (1). However, limitations such as high comorbidity rates, heterogeneity of symptoms within diagnostic groups, and individual differences have raised questions regarding the validity and practicality of this approach (2). In response to such criticisms, transdiagnostic approaches—examining the shared mechanisms underlying various psychopathologies—have emerged as a central focus in clinical research (3). The transdiagnostic approach aims to move beyond traditional diagnostic categories by focusing on the common cognitive, emotional, and behavioral processes underlying different psychological disorders.

In this context, perfectionism has been identified as a common risk factor and maintaining mechanism across a range of psychological conditions, including depression, anxiety, eating disorders, and obsessive–compulsive disorder, thereby demonstrating a transdiagnostic feature (4,5). Perfectionism is characterized by the establishment of unrealistically high and often unattainable standards for oneself and the environment, coupled with intense self-criticism and a sense of inadequacy when these standards are not met (6,7). Adderholdt and Goldberg associated perfectionism with a persistent need for approval, fear of failure, procrastination, and a lack of effective coping strategies (8). Burns defined perfectionism as compelling oneself to achieve unattainable goals and evaluating self-worth primarily in terms of produc-

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tivity and achievement (9). Accordingly, perfectionistic thinking patterns often involve dichotomous ("all-or-nothing") thinking, overgeneralization, and "should" or "must" statements. Such individuals may adopt defensive behaviors in interpersonal relationships due to fears of judgment or criticism, while also displaying perfectionistic expectations toward others. Over time, this pattern can alienate those around them, reinforcing the perfectionist's fear of rejection. Moreover, perfectionists often feel lonely, unlovable, and worthless, leading to difficulties in personal relationships and a tendency toward social withdrawal (9).

Components of Perfectionism and Perfectionism as a Transdiagnostic Mechanism

Initially conceptualized as a symptom specific to depression, obsessive–compulsive disorder, and eating disorders (10,11), perfectionism is now understood as a multidimensional construct. In line with this conceptual shift, two independent research groups have developed distinct Multidimensional Perfectionism Scales (MPS) to capture the multifaceted nature of perfectionism (6,7).

First, Frost et al. operationalized perfectionism through 35 items encompassing six dimensions (6): Personal Standards (PS; setting high personal goals), Concern over Mistakes (CM; reacting negatively to mistakes and perceiving them as failures), Doubts about Actions (DA; doubting one's performance), Parental Expectations (PE; perceiving parents as setting high standards), Parental Criticism (PC; perceiving parental criticism for mistakes), and Organisation (O; emphasis on order and neatness). Among these, concern over mistakes and doubts about actions have been particularly emphasized as key factors with adverse implications for psychological well-being (12).

Second, Hewitt and Flett proposed a 45-item, three-dimensional model incorporating both intrapersonal and interpersonal facets of perfectionism (7). This model distinguishes: (1) self-oriented perfectionism, reflecting the drive to meet internally imposed high standards; (2) other-oriented perfectionism, denoting the imposition of high expectations on others; and (3) socially prescribed perfectionism, capturing the perception that others demand perfection from the individual. Factor analyses of these widely used scales typically yield a two-factor structure, comprising maladaptive evaluative concerns (CM, DA, PC, PE, and self-oriented perfectionism) and positive striving (PS, O, and other-oriented perfectionism) (12,13). Although there is some evidence linking positive striving to adaptive outcomes (14), numerous studies have identified robust associations between positive striving and various forms of psychopathology (4).

These scales, commonly employed in the study of perfectionism across a range of psychopathologies, contribute to four main lines of evidence supporting its transdiagnostic nature. First, perfectionism has been established as a risk factor for diverse disorders, including depression, anxiety, eating disorders, and body dysmorphic disorder (15). Second, elevated perfectionism is linked to the co-occurrence of multiple psychopathologies. Research has associated perfectionism with depression, suicidal ideation, anxiety disorders, interpersonal difficulties, and obsessive–compulsive disorder, and it has been proposed as a mechanism that may account for comorbidity across disorders (12). Third, perfectionism is implicated as a maintaining mechanism in various psychopathologies. Social isolation, diminished self-worth, and pervasive feelings of guilt are among the adverse consequences associated with perfectionism (4). These findings underscore the need to conceptualize perfectionism as a pervasive maintaining factor in psychopathology and as a critical target in treatment interventions (15). Fourth, interventions targeting perfectionism have been shown to yield symptom reductions across different psychopathologies (5). Furthermore, perfectionism has been identified as a barrier to treatment success in depressive disorders, anxiety disorders, and eating disorders (12).

In this regard, perfectionism emerges as a significant variable not only in the onset and maintenance of psychopathology but also in its treatment process. Evidence indicates that perfectionism can negatively influence therapy outcomes, reduce help-seeking behaviors, and undermine the therapeutic alliance (16). Taken together, these consid-

erations highlight the necessity of approaching perfectionism from a transdiagnostic perspective and developing psychological interventions that directly target perfectionism, independent of specific psychopathological diagnoses.

Approaches to the Treatment of Perfectionism

Given the pivotal role of clinical perfectionism in the development and treatment of psychopathology, a range of interventions have been designed to target perfectionism as a primary focus of treatment (17). Among these, Cognitive–Behavioral Therapy for Perfectionism (CBT-P) has been the most extensively researched and widely implemented intervention in clinical practice (18). In recent years, numerous studies have examined the efficacy of CBT delivered in individual, group, and internet-based formats (4).

In addition to CBT, the conceptualization of perfectionism as a personality trait has prompted limited but promising evidence supporting its treatment through long-term psychodynamic approaches (19,20). Furthermore, there is growing interest in mindfulness-based interventions and various self-help strategies aimed at reducing perfectionism. Delivered in both individual and group formats, these approaches, although supported by a modest evidence base, offer valuable insights into the treatment of perfectionism (17,21).

Cognitive–Behavioral Therapy

Cognitive–Behavioral Therapy (CBT) is the most widely applied approach in the treatment of perfectionism. In recent years, alongside the growing interest in transdiagnostic therapies, an advanced form of CBT—Enhanced Cognitive–Behavioral Therapy (CBT-E)—has gained prominence. Unlike conventional CBT, CBT-E does not solely target specific symptoms; rather, it aims to address underlying cognitive patterns and schemas, thereby treating a broad range of psychological disorders. Although initially developed for the treatment of eating disorders, CBT-E's primary goal is to target the mechanisms that maintain psychopathology. Accordingly, it incorporates additional interventions designed to influence psychological processes such as perfectionism, self-criticism, and self-compassion (22).

In general, CBT seeks to modify dysfunctional beliefs related to excessively high personal standards. Through techniques such as self-monitoring and psychoeducation, individuals are encouraged to identify and challenge their irrational perfectionistic beliefs. Behavioral experiments help evaluate the extent to which these beliefs align with reality, while cognitive restructuring addresses cognitive distortions such as selective abstraction (17). Research indicates that group therapy interventions employing CBT techniques yield effective outcomes in reducing perfectionism (22,23,24).

Dynamic Relational Therapy

Dynamic approaches have emerged as a potentially valuable avenue for the treatment of perfectionism (20). Among these, Dynamic Relational Therapy (DRT) conceptualizes perfectionism not merely as a trait, but as a personality style shaped by early relational experiences, which affects functioning both intrapersonally and interpersonally. The primary aim of DRT is to help individuals identify and transform relational cycles that adversely impact their self-perception and relationships with others. This process is facilitated through techniques such as "here-and-now" interventions, relational repair, and interpretation (19).

Hewitt and colleagues have demonstrated the beneficial effects of group-based DRT on perfectionism and its associated difficulties in multiple studies (16,19,20). They emphasize that group therapy fosters a sense of safety, consistency, and acceptance, while encouraging interpersonal risk-taking. Addressing perfectionism within a group context can also lead to lasting changes in self- and other-perceptions (25). In a seminal study, Hewitt et al. found that a 10-session group DRT program produced significant reductions in perfectionism levels, with these effects maintained at a four-month follow-up (19). Moreover, DRT was associated with improvements not only in perfectionism but also in depression, anxiety, and interpersonal problems (16). Focusing on "relational dynamics" as interfering behaviors within therapy has further

been reported to enhance therapeutic alliance, thereby improving treatment adherence and continuity (20).

Mindfulness-Based Therapies

In recent years, the effectiveness of mindfulness-based therapies in addressing perfectionism has been increasingly investigated, yielding encouraging results (18). These interventions aim to enhance individuals' awareness of their thoughts and emotions, cultivate an open and accepting stance toward these experiences, and foster a compassionate self-attitude. Compared to traditional CBT, mindfulness-based approaches encourage individuals to relate to their thoughts with psychological distance, viewing them as mental events rather than absolute truths (21).

One such approach, Mindfulness-Based Cognitive Therapy (MBCT), is designed for group delivery and is classified among third-wave interventions. MBCT emphasizes reducing self-criticism and increasing mindfulness. Given that perfectionism is negatively associated with both self-compassion and mindfulness (26), MBCT offers promising potential for its treatment. For example, James and Rimes reported that group-based MBCT reduced daily perfectionistic thoughts and increased levels of self-compassion (21).

The Present Study

There is empirical evidence supporting the effectiveness of various psychotherapeutic approaches in the treatment of perfectionism. Group psychotherapy, with its focus on interpersonal interactions and shared experiences, may represent a particularly valuable intervention format for addressing perfectionism.

Group-based interventions bring together individuals struggling with similar difficulties, fostering mutual support. This process can reduce feelings of shame and isolation, thereby reinforcing a sense of normalization and belonging (27). The group setting offers perfectionistic individuals an opportunity to observe, reflect upon, and challenge their own thoughts and behaviors, while also promoting the development of empathy, understanding, and reciprocal support among members (28). Through feedback mechanisms within the group, participants can gain greater awareness of the interpersonal impact of their perfectionistic tendencies and take steps toward modifying these patterns (27). Additionally, group psychotherapy has been highlighted as a time- and cost-effective intervention, as it enables simultaneous access to multiple clients (29). In resource-limited clinical contexts, group-based interventions provide an important alternative for reaching a broad client population.

Despite these advantages, to the best of current knowledge, no study has systematically examined the effects of group psychotherapy on perfectionism. In this context, the present systematic review aims to synthesize existing research on group-based psychotherapies targeting the reduction of perfectionism, evaluate outcomes across different group-delivered therapeutic approaches, and determine the effectiveness of these interventions in reducing perfectionistic attitudes and behaviors.

METHOD

To examine the effectiveness of group psychotherapy programs in the treatment of perfectionism, a systematic search was conducted in the PubMed, MEDLINE, Web of Science, Wiley Online Library, Science Direct, and Scopus databases for English-language articles published between 2004 and October 2024, as well as in the ULAKBIM database for Turkish-language publications. The keywords used for the English search were: group therapy OR group intervention OR group treatment AND perfect (to capture perfectionism, perfectionist, perfectionistic). For the Turkish search, the keywords were: grup AND mükemmeliyetçi (with truncation).

The inclusion criteria were as follows: (a) publication between 2004 and 2024; (b) empirical studies assessing treatment effectiveness; (c) randomized controlled trial (RCT) or quasi-experimental design; (d) inclusion of a group psychotherapy method; and (e) examination of the effect of group psychotherapy on perfectionism. Exclusion criteria

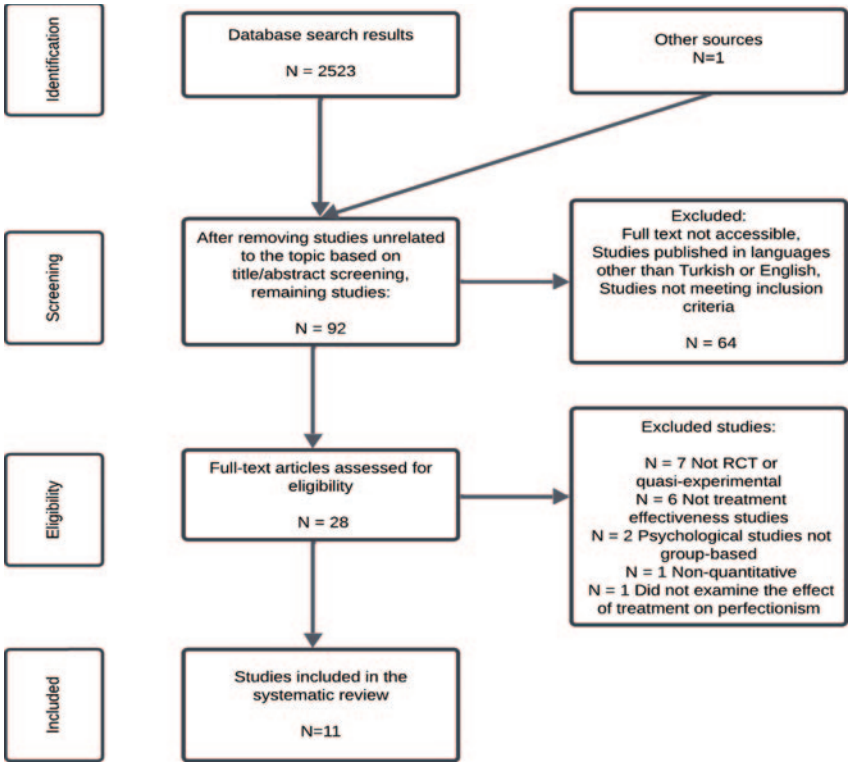

Figure 1. Flowchart of studies included in the systematic review

were: studies employing designs other than RCT or quasi-experimental; interventions delivered in an individual psychotherapy format; studies not assessing the impact of the intervention on perfectionism; publications written in languages other than Turkish or English; and studies not meeting the definition of a treatment effectiveness study.

In the initial search phase, no restrictions were placed on title or abstract fields, and the full record was accessed for all hits. The initial search yielded a total of 2,524 studies. After removing duplicates and screening titles and abstracts for relevance, 92 articles remained. Of these, 64 were excluded because the full text was unavailable, the language was other than Turkish or English, or the study did not meet inclusion criteria. The full texts of the remaining 28 articles were assessed for eligibility. Following the exclusion of studies that (a) were not treatment effectiveness studies, (b) were not quantitative in nature, (c) did not employ RCT or quasi-experimental designs, (d) did not evaluate the effect of treatment on perfectionism, or (e) did not involve a group-based psychotherapy format, a total of 11 published articles met the final inclusion criteria.

The included studies were conducted between 2008 and 2023, and were carried out in Australia (3 studies; 22,30,31), Canada (3 studies; 19,23,32), the United Kingdom (1 study; 21), Greece (1 study; 33), China (1 study; 34), and Iran (2 studies; 28,35). Numerical details regarding the search, screening, and inclusion process are presented in the PRISMA Flow Diagram (see Figure 1).

Title, abstract, and full-text screenings were independently performed by two reviewers. In cases of disagreement, a third reviewer was consulted to reach a final decision. Data extraction from included studies was also performed independently, using a structured data extraction form. Extracted variables included sample characteristics, number and duration of sessions, measurement instruments, type of treatment, follow-up period, and outcome variables.

In evaluating the studies, attention was given not only to the reported findings but also to sample-related details (e.g., inclusion and exclusion criteria), methodological aspects (e.g., treatment approaches, randomization procedures, measurement tools), and group psychotherapy–specific ele-

Table 1. Methodological Characteristics of the Included Studies

Study	Design	Sample	Inclusion Criteria	Exclusion Criteria	Treatment and Control Groups	Random Assignment	Dropout Rate	Assessments	Outcomes	
									Post-test	Follow-up
Handley et al. (2015)	RCT	42 participants (34 female, 9 male)	Scoring above 24.7 on the Concern over Mistakes (CM) subscale of the FMPS; if on medication, maintaining a stable dose for at least one month.	Acute severe disorders (self-harm, suicide, psychosis, substance use disorder), BMI < 17.5, participation in other psychotherapy treatments.	CBT Treatment Group (n = 21) Waitlist Control Group (n = 21)	Yes	None	Pre-test, post-test, 3-month and 6-month follow-up; FMPS, CPQ, DAS-SC, Interference Scale, Distress Scale, BDI-II, EDE-Q, Anxiety subscale of the DASS-21, FNE-B, PSWQ, ASI-3, Q-LES-Q-18, RSES, RNTS.	Significant improvements in perfectionism, depressive symptoms, eating disorder symptoms, social anxiety, anxiety sensitivity, rumination, self-esteem, and quality of life; changes in perfectionism significantly predicted changes in other variables (depression, eating disorder symptoms, social anxiety, rumination, self-esteem, quality of life); CBT > Control.	Improvements maintained at 3- and 6-month follow-up.
Hewitt et al. (2023)	RCT	80 participants (58 female, 21 male, 1 nonbinary)	Scoring at least one standard deviation above the mean on any perfectionism dimension.	Acute severe disorders (psychosis, suicidal ideation); unwillingness to disclose personal information during the interview; no history of close relationships.	DRT Treatment Group (n = 41) SPT Comparison Group (n = 39)	Yes	10	Pre-test, mid-test, post-test, 6-month follow-up; MPS, PSPS, PCI, BSI, SWLS, WSAS	Both DRT and SPT groups showed improvements in all perfectionism components, as well as in life satisfaction, work functioning, and social adjustment. Greater improvements in self-oriented perfectionism, perfectionistic self-presentation, nondisclosure of imperfection, and nondisplay of imperfection were observed in the DRT group compared to the SPT group..	Improvements were maintained at the 6-month follow-up.
James & Rimes (2017)	RCT	60 university students (49 female, 11 male)	Age ≥ 18; score ≥ 22 on the Concern over Mistakes subscale of the FMPS; perfectionism considered significantly impairing; significant impairment in key life domains; if taking antidepressant medication, on a stable dose for at least 3 months.	Current serious suicidal ideation; currently receiving any psychological treatment targeting perfectionism; diagnosis of substance dependence or anorexia nervosa according to DSM-IV.	MBCT Treatment Group (n = 28) CBT Self-Help Comparison Group (n = 32)	Yes	5	Pre-test, post-test, 10-week follow-up; MINI, SCID-I, FMPS, CPQ, WASAS, DASS, FFMQ, BESS, SCS, TEQ, RRQ.	Significant changes in perfectionism, emotions, repetitive thoughts, mindfulness, self-compassion, and reductions in unhelpful beliefs about experiential avoidance; MBCT > Self-Help Group.	Improvements maintained at the 10-week follow-up.
Zikopoulou et al. (2021)	RCT	81 young adults (M_{age} = 21.95)	Score at least one standard deviation above the mean on any FMPS subscale.	Not specified.	CBT Treatment Group (n = 40) Inactive control group (n = 41).	Yes	48	Pre-test, post-test; FMPS, DASS-21, STAI, MOPS.	CBT group showed greater improvements than the control group in perfectionism scores, Concern over Mistakes subscale, and reductions in depression, anxiety, and stress scores.	No follow-up assessment conducted.
Zuo & Zhang (2023)	RCT	64 university students (36 female, 28 male)	Being an undergraduate or graduate student; willingness to participate in group therapy; FMPS score ≥ 84; SDS score between 53 and 72 standard points or SAS score between 50 and 70 standard points; commitment to attend group therapy until completion.	Severe mental disorders (psychosis, suicidal tendency, etc.); participation in other psychological treatments; any change in psychotropic medication within 3 months prior to therapy initiation.	CBT□Positive Psychology Treatment Group (n = 32) Waitlist Control Group (n = 32).	Yes	8	Pre-test, post-test, 8-week follow-up; FMPS, SDS, SAS	CBT□PP group showed greater improvements than the control group in the Concern over Mistakes and Doubts about Actions subscales, as well as reductions in depression and anxiety scores.	Improvements were maintained at the 8-week follow-up, though the effect sizes were reduced.
Wade et al. (2017)	RCT	40 adult women with eating disorders	Age over 18; BMI > 17.5 and BMI < 30.	Severe mental disorders (suicidal tendency, psychotic disorders).	CBT-E Treatment Group (n = 19) Waitlist Control Group (n = 21).)	Yes	12	Pre-test, post-test, 3-month follow-up; EDE, BMI, EDE-Q, RSES, CPQ, TOMS, IIP-32, MINI.	No significant change in perfectionism scores between pre- and post-test; however, CBT-E group showed greater improvements than the control group in eating disorder symptoms, self-esteem, perceived difficulties, and emotion tolerance scores.	Perfectionism scores showed significant changes between post-test and follow-up; other improvements were maintained at the 3-month follow-up.
Babaei et al. (2022)	Quasi-experimental design	25 university students (14 women, 11 men)	Age 20□35; at least associate-level education; not currently receiving any other therapy; scoring at least 0.5 SD above the mean on a perfectionism measure.	Severe mental disorders (e.g., substance use, psychosis, borderline personality disorder); missing more than three sessions	Brief DRT Treatment Group (n = 12) Waitlist Control Group (n = 13)	Yes	5	Pre-test, post-test, 1-month follow-up, 4-month follow-up; SCID-5-RV, SCID-5-PD, TMPS, PSPS, PCI, BDI-II, BAI, IIP-32	Brief DRT group showed greater improvements than the control group in perfectionism, anxiety, depression, and interpersonal problems.	Improvements were maintained at both the 1-month and 4-month follow-ups.
Hamedani et al. (2023)	Quasi-experimental design	30 female university students	Scoring above the cut-off point on the Hill□s Perfectionism Questionnaire, Self-Criticism Scale, and Self-Compassion Scale; agreeing to attend all sessions and comply with group rules.	Presence of severe psychiatric disorders; use of psychiatric medication; participation in other psychotherapy or counseling sessions.	CBT-E Treatment Group (n = 15) Control Group (n = 15).	Yes	None reported	Pre-test, post-test; Hill□s Perfectionism Questionnaire, Self-Criticism Scale, Self-Compassion Scale.	The CBT-E group showed greater improvements than the control group in perfectionism, self-criticism, and self-compassion.	No follow-up assessment conducted.
Hewitt et al. (2015)	Quasi-experimental design	71 participants (47 females, 24 males)	Scoring at least half a standard deviation above the mean on at least one perfectionism dimension.	Presence of severe psychiatric disorders (e.g., suicidal tendency, psychosis); unwillingness to provide personal information during the interview.	DRT Treatment Group (n = 53) Waitlist Control Group (n = 18).	Yes	10	Pre-test, post-test, 4-month follow-up; MPS, PSPS, PCI, BDI, BAI, IAS, IIP.	The DRT group showed greater improvements than the control group in perfectionism, anxiety, depression, and interpersonal problems.	Improvements were maintained at the 4-month follow-up.
Kutlesa & Arthur (2008)	Quasi-experimental design	90 university students (75 females, 15 males)	Not specified	Not specified	CBT and Interpersonal Therapy Treatment Group (n = 30) Career Comparison Group (n = 30) Psychology Comparison Group (n = 30).	Yes	46	Pre-test, post-test; BDI-II, BAI, MPS	The CBT and Interpersonal Therapy group showed greater improvements in perfectionism, depression, and anxiety compared to the control groups.	No follow-up assessment conducted.
Sadri et al. (2017)	Quasi-experimental design	11 participants diagnosed with OCD (M_{age} = 40.00)	Age 18 or older, primary OCD diagnosis, score of 22 or higher on the FMPS Concern over Mistakes subscale.	Acute severe disorders (suicidal tendencies, psychosis), participation in other psychological treatments, changes in psychiatric medication dosage (if used, dose had to remain stable).	CBT Treatment Group (n = 4) Waitlist Control Group (n = 7).	Yes	8	Pre-test, post-test, 3-month follow-up; YBOCS, FMPS, CPQ.	CBT was associated with improvements in perfectionism and OCD severity, though statistical significance was not achieved.	At follow-up, two of the three participants showed continued improvement, while one participant reported worsening symptoms..

Type of Group Therapy: DRT: Dynamic Relational Therapy, MBCT: Mindfulness-Based Cognitive Therapy, SPT: Supportive Psychodynamic Therapy

Scales: SCID-5-RV: Structured clinical interview for DSM -5 disorders, SCID -5-PD: Structured clinical interview for DSM -5 personality disorders, TMPS: Tahram Multidimensional Perfectionism Scale, PSPS: Perfectionistic self-presentation scale, PCI: Perfectionism co gnitions inventory, BDI -II: Beck depression inventory -II, BAI: Beck anxiety inventory (BAI), IIP -32: Inventory of interpersonal problems, FMPS: Frost Multidimensional Perfectionism Scale, CPQ: Clinical Perfectionism Questionnaire, DASSC: Dysfunctional Attitudes Scale-Self Criticism, EDE-Q: Eating Disorder Examination Questionnaire, FNEB: Fear of Negative Evaluation Scale-brief version, PSWQ: Penn State Worry Questionnaire, ASI-3: Anxiety Sensitivity Index-3, Q-LES-Q-18: Quality of Life, Enjoyment and Satisfaction Questionnaire-18, RSES: Rosenberg Self-Esteem Scale, RNTS: Repetitive Negative Thinking Scale, MPS: Multidimensional Perfectionism Scale, BSI: Brief Symptom Inventory, SWL S: The Satisfaction With Life Scale, WSAS: Work and Social Adjustment Scal e, IAS: Interaction Anxiousness Scale, DASS-21: Depression Anxiety Stress Scale-21, STAI: Spielberger State-Trait Anxiety Inventory, MOPS: Measure of Parental Style, SDS: Self-Rating Depression Scale, SAS: Self-Rating Anxiety Scale, FFMQ: Five Facets Mindfulness Questionnaire, WOQ: Written Open Questions, SSI: Semi-structured Interview, YBOCS: Yale-Brown Obsessive Compulsive Scale, DAS: Dysfunctional Attitude Scale, MINI: The Mini -International Neuropsychiatric Interview, EDE: Eating disorder examination, BMI: Body Mass Index, , TOMS: Tolerance of mood states scale, BES: Beliefs about Emotions Scale, TEQ: The Experiences Questionnaire, SCS: Self-Compassion Scale,RRQ: The Rumination Responses Questionnaire

Table 2. Characteristics of Group Therapy

Study	Type of Group Therapy	Session Duration	Number of Sessions	Therapy Frequency	Number of Therapists	Number of Members	Group Therapy Tecniques
Babaei et al. (2022)	Short-Term Dynamic Relational Therapy (DRT)	90 minutes	16 weeks	Once a week	Two	15	The group therapy was divided into four stages: • "Attachment and verbal bonding" stage (Sessions 1 □2): In this stage, the therapist works to highlight commonalities among group members with different experiences and helps manage anxiety levels to ensure a safe environment. • "Pattern breaking" stage (Sessions 3 □7): The therapist supports group members in deepening their experiences and emotions, helping them express feelings and thoughts through increasingly challenging interventions. Resistance is at its highest level in this stage. • "Self-redefinition/authenticity filled with pain" stage (Sessions 8 □14): This stage focuses on questioning limiting patterns in communication and self-concept. Group members review their interaction patterns and attitudes toward themselves. • "Termination" stage (Sessions 15 □16): In this stage, significant experiences gained in the group therapy are integrated, and group members work on expressing feelings related to loss and unresolved issues. Additionally, each participant attended a one-session individual preparation meeting to facilitate the group process.
Hamedani et al. (2023)	Enhanced Cognitive Behavioral Therapy (CBT-E)	120 minutes	8 weeks	Once a week	One	15	Assessment of perfectionism, fostering and conceptualizing motivation for change, recognizing the difference between reality and fantasy, cognitive-behavioral formulation, behavioral experiments, psychological and self-help training, problem-solving training, challenging dichotomous thinking through behavioral experiments, addressing rigidity, overly high standards, broad attention, cognitive distortions, and cognitive biases, keeping daily thought records, addressing procrastination, problem-solving, time management, and scheduling pleasurable activities; emotional skills training, self-evaluation, reducing fear of making mistakes, fostering self-compassion over self-criticism, self-assessment, and relapse prevention.
Handley et al. (2015)	Cognitive Behavioral Therapy (CBT)	120 minutes	8 weeks	Once a week	Two	20	Psychoeducation on understanding perfectionism, motivation for change, behavioral experiments, thought records, reducing procrastination, reducing self-criticism, and balancing self-confidence.
Hewitt et al. (2023)	Dynamic Relational Therapy (DRT) Supportive Psychodynamic Therapy (SPT)	90 minutes	12 weeks	Once a week	Two	8-9	Dynamic-Relational Therapy (DRT): • Focuses on the patient□s relational dynamics with themselves and others • Interprets interactions among group members and group processes • Aims to explore and understand the patient□s relational needs with themselves and others Supportive Psychodynamic Therapy (SPT): • Aims to help patients adapt to life situations and challenges arising from perfectionism • Focuses on reinforcing support, empathic understanding, and appropriate problem-solving skills • Avoids interpreting interactions among group members While DRT focuses more on interpretative and relational processes, SPT adopts a more supportive approach.
Hewitt et al. (2015)	Dynamic Relational Therapy (DRT)	90 minutes	11 weeks	Once a week	Two	7-10	□Here-and-now□ approach, exploring relationships and experiences among group members, expressing emotions, providing interpersonal feedback, and interpreting transference reactions within the group.
James & Rimes (2017)	Mindfulness-Based Cognitive Therapy (MBCT)	120 minutes	8 weeks	Once a week	Two	?	Mindfulness meditation practices, inquiry, attentional focus, strategies for coping with negative thoughts and emotions, psychoeducation, and compassion meditation.
Kutlesa & Arthur (2008)	Cognitive Behavioral Therapy with an Interpersonal Approach	?	4 weeks	Twice a week	One	8	Principles of interpersonal theory focusing on the □here and now,□ knowledge and skills training, relaxation techniques, cognitive restructuring, role modeling, self-reinforcement techniques, and stress reduction techniques.
Sadri et al. (2017)	Cognitive Behavioral Therapy (CBT)	120 minutes	8 weeks	Once a week	?	?	?
Wade et al. (2017)	Enhanced Cognitive Behavioral Therapy (CBT-E)	120 minutes	20 weeks	Once a week	Two-Three	?	The group CBT-E treatment consists of four stages: During the first four sessions, the focus was on motivation, psychoeducation, regular eating, and emotion regulation. In the following two sessions (weeks 7 and 8), the aim was to conduct a detailed review of progress and identify factors hindering change. Sessions held between weeks 9 and 17 addressed over-evaluation of eating, shape, and weight, shape-checking and avoidance, cognitive distortions, and dietary rules. In this stage, additional sessions targeted maintaining factors such as personal perfectionism, low self-esteem, and interpersonal difficulties. The final two sessions focused on developing maintenance plans and preventing relapse.
Zikopoulou et al. (2021)	Cognitive Behavioral Therapy (CBT)	120 minutes	10 weeks	Once a week	?	?	Psychoeducation, behavioral experiments, cognitive strategies, modification of cognitive distortions, and cognitive-behavioral techniques.
Zuo & Zhang (2023)	Cognitive Behavioral Therapy (CBT)- Positive Psychotherapy	120 minutes	8 weeks	Once a week	One (Three assistant facilitators)	?	Identification of negative automatic thoughts, ABC theory, behavioral experiments, cognitive restructuring, practices for viewing mistakes and failures from a positive perspective, restructuring participants□ past mistakes and failures, learned optimism, hope-oriented thinking, and process orientation.

ments (e.g., session length, number and frequency of sessions, number of therapists, group size, and techniques employed).

RESULTS

Details of the included studies are summarized in Table 1 and Table 2.

Methodological Characteristics of the Studies

Of the 11 studies reviewed, six employed a randomized controlled trial design to examine treatment effects. The remaining five studies utilized a quasi-experimental design (19,23,28,30,35).

Sample

In six of the reviewed studies, the sample comprised university students and young adults (21,23,28,33,34,35). One study was conducted with a sample diagnosed with an eating disorder (31), and another with participants diagnosed with obsessive–compulsive disorder (OCD) (30). Across studies, females were generally overrepresented; only two studies reported a balanced gender distribution (34,35)

Inclusion and Exclusion Criteria

Inclusion criteria across the studies were primarily based on the assessment of perfectionism levels and the requirement to exceed specific cutoff scores. In all studies, individuals scoring high on

the Frost Multidimensional Perfectionism Scale (FMPS) or on subscales of other perfectionism measures were included in the sample. Additionally, some studies required participants to have at least an associate degree (35), to fall within specific age ranges (e.g., university students or aged 18 years and above) (21,31,34), and to be willing to participate in group therapy (28,34).

Exclusion criteria most commonly included acute severe psychiatric disorders (e.g., suicidal ideation, psychosis, substance use disorder) (n = 9), concurrent engagement in another psychological treatment (n = 5), and unstable psychiatric medication use (n = 5). Furthermore, participants with extremely low body mass index (BMI < 17.5) (22,31) or a diagnosis of anorexia nervosa (21) were excluded from treatment participation, as these conditions were considered potential barriers to engagement (21,22,31). Only two studies did not specify any exclusion criteria (23,33).

Treatment and Control/Comparison Groups

In the reviewed studies, treatment groups consisted of group therapy interventions based on various psychotherapeutic approaches. The most frequently used interventions were Cognitive–Behavioral Therapy (CBT) and its adaptations, such as Enhanced Cognitive–Behavioral Therapy (CBT-E) (n = 7). Three studies implemented Dynamic Relational Therapy (19,32,35), while one study employed Mindfulness-Based Cognitive Therapy (21). Control group conditions most commonly consisted of a waitlist (n = 8). In addition, three studies utilized comparison groups, which included active interventions such as a career support group (23), a CBT self-help group (21), and supportive psychodynamic therapy (32).

Except for one study (19), the number of participants in treatment and control groups was balanced. The size of the treatment groups ranged from 12 to 53 participants, with control groups showing a similar range. All studies employed random assignment to treatment and control groups.

Measurement Instruments and Assessment Frequency

Across the studies, a range of instruments was employed to assess multidimensional psychological variables such as perfectionism, depression, anxiety, eating disorder symptoms, self-esteem, and quality of life. Commonly used measures of perfectionism included the Frost Multidimensional Perfectionism Scale (FMPS), the Perfectionistic Self-Presentation Scale (PSPS), the Perfectionism Cognitions Inventory (PCI), the Clinical Perfectionism Questionnaire (CPQ), and the Multidimensional Perfectionism Scale (MPS). Additionally, measures targeting anxiety, depression, and stress—such as the Beck Depression Inventory-II (BDI-II), the Beck Anxiety Inventory (BAI), and the Depression Anxiety Stress Scales-21 (DASS-21)—were used for supplementary analyses.

In terms of assessment frequency, pre-test and post-test measurements were typically followed by follow-up assessments (e.g., at 3 months, 6 months, or 8 weeks) to evaluate the maintenance of therapeutic effects. Only three studies did not include any follow-up assessments (23,28,33).

Content and Implementation of Group Therapies in the Studies

Type of Group Therapy and Techniques Employed

The most frequently implemented therapy type across the studies was Cognitive–Behavioral Therapy (CBT) (n = 7). One of these studies integrated CBT with principles of Interpersonal Therapy (23), while another combined CBT with Positive Psychotherapy (34). In general, CBT-based interventions focused on psychoeducation, identification and restructuring of cognitive distortions, and behavioral experiments. However, the study by Sadri et al. did not provide any information regarding the specific techniques used (30).

Handley et al. conducted eight weekly sessions that incorporated psychoeducation on understanding perfectionism, thought records, strategies to

enhance self-confidence, reduction of self-criticism, and behavioral experiments (22). Similarly, Zikopoulou et al. implemented ten weekly sessions emphasizing cognitive restructuring and other cognitive–behavioral strategies (33). Enhanced Cognitive–Behavioral Therapy (CBT-E) was applied in two studies (28,31). The transdiagnostic treatment plans of CBT-E targeted reductions in cognitive distortions and self-criticism. In their eight-week program, Hamedani et al. supplemented the intervention with training in time management and problem-solving skills (28). Wade et al., in a 20-week, four-stage program, addressed regular eating patterns, cognitive distortions, and interpersonal problems, concluding with relapse prevention planning (31).

Zuo and Zhang integrated CBT with Positive Psychotherapy techniques in an eight-week group program (34). This intervention included positive psychology–oriented strategies such as restructuring negative automatic thoughts, adopting a more constructive perspective toward mistakes and failures, and fostering hope-oriented thinking. Kutlesa and Arthur combined CBT with Interpersonal Therapy in a four-week program with twice-weekly sessions, employing "here-and-now" techniques, relaxation strategies, cognitive restructuring, and self-reinforcement exercises (23).

Following CBT, the second most frequently used therapeutic approach was Dynamic Relational Therapy (n = 3), which aims to help individuals understand and modify the dynamics within their interpersonal relationships. Babaei et al. delivered a 16-week program organized into four stages—engagement, pattern interruption, self-redefinition, and termination—during which relational dynamics among group members were explored in depth, and participants' self-attitudes were reconstructed (35). Hewitt et al. (32) conducted a 12-week program incorporating interpretive work on group members' relational dynamics and exploration of transference processes within the group. In another study, Hewitt et al. (19) implemented an 11-week intervention featuring techniques such as emotional expression and interpretation of transference reactions within the group setting.

Mindfulness-Based Cognitive Therapy (MBCT) was applied in only one study (21). This intervention focused on enhancing mindfulness and self-compassion skills. In their eight-week program, James and Rimes incorporated mindfulness meditation, strategies for coping with negative thoughts, and compassion-focused meditation techniques (21).

Session Characteristics and Duration

Across the 11 reviewed studies, the duration of group therapy sessions ranged from 90 to 120 minutes, with the majority conducted as 120-minute sessions (n = 7). Three studies reported sessions lasting 90 minutes (19,32,35), while one study did not specify session length (23).

In terms of session frequency, a once-weekly schedule was the most commonly adopted format. The only exception was the study by Kutlesa and Arthur, in which sessions were held twice per week (23).

The total duration of therapy varied across studies, ranging from 4 to 20 weeks. Most interventions spanned 8 weeks (n = 5), though other formats included 10 weeks (23), 11 weeks (19), 12 weeks (32), and 16 weeks (35). The shortest intervention was implemented by Kutlesa and Arthur (23), consisting of a 4-week program with two sessions per week. The longest was conducted by Wade et al., who delivered a 20-week program with weekly sessions, each stage targeting specific therapeutic goals (31).

Some studies incorporated additional individual preparation sessions or individual therapy processes to complement the group intervention. For instance, Babaei et al. conducted two individual preparatory sessions prior to group therapy, aiming to enhance participants' readiness and adaptation to the group process (35). Similarly, Hamedani et al. also included individual preparatory components in their intervention (28).

Number of Members and Therapists

In the reviewed studies, group sizes generally ranged from 7 to 15 members. For example, in the

studies by Babaei et al. (35) and Hamedani et al. (28), each group consisted of 15 members, whereas in the study by Hewitt et al. (19), group sizes ranged from 7 to 10 members. In some studies, the number of members was not specified (21,23,30,31,34).

The number of therapists was most commonly two, although in some studies the group process was facilitated by a single therapist. For instance, in the studies by Hamedani et al. (28) and Kutlesa and Arthur (23), one therapist led the intervention. In contrast, Zuo and Zhang's (34) study involved one therapist supported by three assistant facilitators. In certain longer or more structured programs—such as the intervention by Wade et al.—two to three therapists were reported to have conducted the sessions (31).

Pre- and Post-Treatment Comparison Results

Overall, group therapies were found to be effective in reducing perfectionism. Cognitive–Behavioral Therapy (CBT) was the most frequently implemented approach, with most CBT-based studies reporting significant improvements. In the study by Handley et al. (22), significant changes were observed in perfectionism, depression, eating disorder symptoms, social anxiety, rumination, self-esteem, and quality of life in the CBT group compared to the control group. Furthermore, changes in perfectionism within the CBT group significantly accounted for improvements in depression, eating disorder symptoms, social anxiety, and self-esteem. These effects were maintained at 3- and 6-month follow-up assessments.

Similar findings were reported in the studies by Zikopoulou et al. (33), Kutlesa and Arthur (23), and Hamedani et al. (28), although no follow-up assessments were conducted in these studies. In addition to reductions in perfectionism, significant improvements were noted in depression and anxiety scores (23,33) and in self-criticism and self-compassion (28).

In their study integrating CBT with Positive Psychotherapy techniques, Zuo and Zhang reported improvements in the Concern over Mistakes and Doubts about Actions subscales of perfectionism. However, these effects partially diminished at follow-up. Significant improvements were also observed in depression and anxiety scores, with these changes maintained at the 2-month follow-up (34).

In the study by Wade et al., conducted with individuals diagnosed with eating disorders, no significant pre–post changes were found in clinical perfectionism scores in the CBT-E group; however, positive effects emerged during follow-up. Additionally, significant pre–post improvements were reported in eating disorder symptoms, self-esteem, interpersonal difficulties, and emotion tolerance, with these changes maintained at the 3-month follow-up (31).

The study by Sadri et al. (30) found that CBT led to improvements in perfectionism and obsessive–compulsive disorder (OCD) severity among individuals diagnosed with OCD; however, these improvements did not reach clinical significance. Moreover, due to a high dropout rate, follow-up data were collected from only three participants—two of whom maintained improvement in perfectionism, while one reported deterioration.

Dynamic Relational Therapy (DRT) interventions also produced significant improvements across various dimensions of perfectionism. In the study by Hewitt et al. (32), improvements were observed in both the DRT and supportive psychodynamic therapy (SPT) groups; however, greater changes were recorded in the DRT group in self-oriented perfectionism, perfectionistic self-presentation, and nondisclosure of imperfection. These effects were maintained over a 6-month follow-up period. In the study by Babaei et al., a short-term DRT intervention produced significant improvements in perfectionism and related psychological difficulties (e.g., depression and anxiety) compared to a control group, with these effects sustained over a 4-month follow-up (35). Similarly, positive effects of DRT on perfectionism were reported in the study by Hewitt et al. (19).

Finally, in a study conducted by James and Rimes with university students, Mindfulness-Based

Cognitive Therapy (MBCT) resulted in improvements in perfectionism, rumination, mindfulness, and self-compassion. These gains were maintained at the 10-week follow-up (21).

DISCUSSION

This systematic review examined the effects of group psychotherapies on reducing perfectionism, with findings varying according to the type of intervention, sample characteristics, and follow-up duration. Overall, group-based approaches such as Cognitive–Behavioral Therapy (CBT), Dynamic Relational Therapy (DRT), and Mindfulness-Based Cognitive Therapy (MBCT) demonstrated significant improvements, particularly in non-clinical populations. However, in clinical populations, the entrenched nature of perfectionism and the presence of comorbid psychopathologies resulted in more limited and complex patterns of effectiveness.

Several factors may underlie this limitation. First, in clinical populations, perfectionism often manifests as a deeply ingrained and chronic trait, making it more difficult to alter perfectionistic thought and behavior patterns through short-term interventions. Second, co-occurring psychiatric symptoms (e.g., severe anxiety, depression, personality disorders) can negatively impact engagement in therapy and the rate of change within the therapeutic process. Third, establishing and maintaining a therapeutic alliance may be more challenging in clinical samples. Fear of making mistakes, and concerns about criticism or evaluation, may lead perfectionistic individuals to participate less in group therapy and contribute to higher dropout rates. Consequently, research involving clinical samples requires more structured, longer-term, and individualized intervention programs.

In non-clinical samples, CBT has shown effectiveness by directly targeting perfectionistic cognitions and behaviors (22,33). Techniques such as cognitive restructuring, psychoeducation, and behavioral experiments have been found to enhance cognitive flexibility in perfectionists, thereby facilitating change. However, as observed in the study by Zuo and Zhang, these improvements partially diminished at follow-up (34), indicating the need to reinforce group interventions with long-term support mechanisms and relapse prevention strategies.

Findings from DRT interventions underscore the importance of addressing the interpersonal and self-representational dimensions of perfectionism. Hewitt et al. reported that DRT led to significant improvements in self-oriented perfectionism, perfectionistic self-presentation, and nondisclosure of imperfection, with these effects maintained over the follow-up period (32). This supports the conceptualization of perfectionism as not solely cognitive but also relational in nature. Similarly, Babaei et al. found that a short-term DRT program produced improvements in perfectionism as well as in depressive and anxiety symptoms (35). Taken together, these findings suggest that perfectionism is shaped within interpersonal dynamics and that DRT, by targeting these dynamics, can serve as an effective intervention. Hewitt et al. have emphasized the role of relational components in the emergence of perfectionism and the importance of addressing both causal and maintaining factors through group-based DRT (20).

Only one study examined the group format of MBCT, yielding significant results (21). This intervention effectively reduced ruminative thinking, increased self-compassion, and lowered stress levels associated with perfectionism. The findings suggest that MBCT offers a promising approach for reducing the negative thoughts and emotions associated with perfectionism. In MBCT, acceptance and self-compassion are taught as tools for coping with distressing thoughts, feelings, and experiences. As individuals enhance their awareness, they learn to respond with empathy, kindness, calmness, and patience. Discussing these processes within a group context may help reduce dysfunctional beliefs and self-judgment (36). Furthermore, MBCT has been shown to reduce rumination (37) and dysfunctional beliefs about emotions (36), while fostering a more decentered perspective toward thoughts (26). This approach directly addresses maladaptive beliefs, self-critical cognitions, low self-compassion, and limited mindfulness—core features often associated with perfectionism. Indeed, low self-compassion has been linked to maladaptive emotion regulation in response to failure (38). While perfection-

istic concerns can lead to severe self-criticism following perceived failure (13,14), MBCT promotes openness, acceptance, and a nonjudgmental stance toward setbacks and mistakes (26). This theoretical alignment between MBCT's structure and the core features of perfectionism may explain the significant results obtained in the study.

In summary, in non-clinical groups, the effect of group therapy on perfectionism was found to be significant regardless of the therapeutic approach. However, these favorable outcomes may be attributable to the greater flexibility and treatment responsiveness of perfectionism in non-clinical populations. Indeed, rigid cognitive patterns such as "concern over mistakes" and "personal standards" appear to be more resistant in clinical groups (39,40). Only two of the studies included in this systematic review involved clinical samples. The study by Sadri et al., involving individuals with OCD, did not achieve clinically significant results in reducing perfectionism (30). Similarly, Wade et al. reported no significant pre–post changes in perfectionism among individuals with eating disorders, with reductions observed only between post-treatment and follow-up assessments (31).

In clinical populations, particularly those with eating disorders and OCD, the effectiveness of group therapy has produced more variable results. For example, studies by Lloyd et al. (41) and Tchanturia et al. (40) reported significant reductions in perfectionism among individuals diagnosed with anorexia nervosa (AN), particularly in the subscales of "concern over mistakes" and "personal standards," with the group setting providing a safe environment for sharing experiences. Conversely, Levinson et al. found that while high personal standards decreased following intervention, concern over mistakes remained resistant to change (39). Given that concern over mistakes is the subscale most strongly associated with eating disorders (42), this finding suggests that treatment protocols should place greater emphasis on this domain. The positive responsiveness of high personal standards to group-based interventions may be related to the construct's sensitivity to social comparison; the group setting allows individuals to evaluate their standards in relation to others and to reconsider them accordingly. Similarly, concern over mistakes may also be addressed through interpersonal exchanges in the group context, where social feedback and shared experiences help individuals recognize and challenge cognitive biases. Therefore, targeting concern over mistakes—one of the core mechanisms in eating disorders—within the group's social context could contribute to the development of strategies that enhance intervention effectiveness.

Wade et al. further reported that a CBT intervention for individuals with eating disorders did not yield significant short-term improvements, but positive effects emerged during follow-up (31). This finding suggests that in eating disorders, changes in perfectionism may require more time and that long-term, staged interventions are necessary.

For individuals with OCD, the effectiveness of group therapy has been found to be more limited. In the study by Chik et al., group interventions did not yield significant effects on perfectionism, suggesting that in certain clinical conditions, perfectionism may represent a secondary feature (43). Similarly, Sadri et al. found that CBT produced only partial improvements in OCD patients, and these changes did not reach clinical significance (30). Such findings indicate that in clinical groups such as OCD, perfectionism tends to be more resistant and less responsive to intervention, highlighting the need for group-based treatments to be supplemented with individualized strategies (44).

Low participation rates and high dropout rates (30) also emerge as important factors limiting the feasibility of group psychotherapies. For example, in the aforementioned study, a dropout rate of 42% was reported, with many participants withdrawing before initiating treatment. The researchers interpreted this as an indication that group therapy may be discouraging for some individuals. In this context, it has been emphasized that for individuals with OCD, individual therapy formats should be prioritized, and strategies should be developed to enhance participation rates (30).

The lower effectiveness of group-based interventions in clinical samples suggests that, in certain psychopathologies, other transdiagnostic proces-

ses—beyond perfectionism—may play a more central etiological role. Indeed, in OCD, cognitive biases such as thought–action fusion and inflated responsibility, which often accompany perfectionism, have been consistently identified in the literature as core and maintaining factors of the disorder (45). One possible explanation is that such disorder-specific cognitive processes may need to be addressed prior to directly targeting perfectionism.

Although perfectionism, by virtue of its close relationship to social comparison, is a suitable target for group-based work, focusing exclusively on perfectionism without addressing OCD-specific symptoms (e.g., thought–action fusion) may fail to yield clinically meaningful change. Therefore, before evaluating the effectiveness of group interventions in clinical samples, it is recommended to clearly define the primary cognitive mechanisms within the relevant psychopathology and to address perfectionism subsequently within the group context.

The effectiveness of group interventions also varies according to implementation dynamics and content. Steele et al. found that psychoeducational materials alone were ineffective, whereas group-based CBT produced significant reductions in perfectionism and negative affect (24). The fact that the intervention also reduced diagnoses of major depressive disorder and social phobia underscores the transdiagnostic role of perfectionism. In this regard, interventions should not be limited to cognitive change alone but should also incorporate compassion-focused and relational techniques.

Nevertheless, the limitations of group interventions should not be overlooked. In particular, the high dropout rates observed in clinical samples (30) pose challenges for treatment engagement. In Cheli's study, group interventions were found to be effective among individuals diagnosed with personality disorders; however, improvement occurred following individual therapy (44). This finding suggests that group therapy alone may be insufficient for individuals with personality pathology and should be supplemented with individual treatment.

While conducting group therapy with clinical samples, as in the studies mentioned above, is a considerable strength, none of these studies employed a control group condition. This raises the possibility that observed improvements may be attributable to confounding factors such as temporal effects, and should therefore be considered an important limitation (24,30,39,40,41,42,43).

Another possible reason for the limited effectiveness of group therapy in clinical populations is that perfectionism may crystallize into a more rigid, personality-level construct. As Hewitt et al. note, perfectionism develops within an interpersonal context, and defense mechanisms such as concealing flaws or striving to appear perfect in relationships may come into play (20). The effort to maintain a flawless image in a group setting may lead perfectionistic individuals to adopt defensive behaviors during therapy (20). At this point, as illustrated in the study by Babaei et al., the inclusion of individual preparatory sessions may serve as a strategy to enhance adaptation to group therapy (35).

Variations in implementation across the included studies may also be considered an important factor contributing to the heterogeneity of findings. For example, the number of group members, number of sessions, and number of therapists are critical variables shaping therapeutic effectiveness. In the study by Sadri et al., the small sample size (n = 11) may partly explain the absence of significant effects (30). Moreover, because information on the number of therapists, group size, and techniques employed was not reported, it is difficult to determine how these variables might have influenced outcomes.

Similarly, the study by Zikopoulou et al. reported the highest number of dropouts (n = 48) (33). As the number of therapists and group size were not specified, it is not possible to ascertain whether the high attrition rate was attributable to features of the intervention. On the other hand, despite the high dropout rate, the intervention appeared effective among those who completed the program, suggesting that individuals who stood to benefit from psychological treatment may have been more likely to remain engaged. Additionally, because no follow-up assessments were conducted, it is difficult to draw conclusions regarding the durability of

effects. Likewise, Kutlesa and Arthur's study also reported high dropout (n = 46) (23). This study employed an intensive format—four weeks with two sessions per week—which may have affected participant motivation and feasibility. Although both studies yielded significant reductions in perfectionism, the absence of follow-up data prevents evaluation of long-term effects.

In sum, the findings of this review indicate that group psychotherapies can be effective in reducing perfectionism, though effectiveness differs between clinical and non-clinical populations. Group-based interventions tend to produce quicker gains among non-clinical participants, whereas in clinical populations the more rigid and maintaining nature of perfectionism necessitates longer and more tailored interventions. Specifically targeting resistant subdimensions such as concern over mistakes, and augmenting interventions with compassion-focused and dynamic relational techniques, may enhance therapeutic impact.

This review has several limitations. First, methodological heterogeneity across studies (e.g., measurement tools, session length, number of sessions, number of therapists, and group size) complicated direct comparison of results. Differences in group size (e.g., ranging from 7 to 15 members) and treatment duration (4–20 weeks) may also have influenced outcomes. Second, there was considerable heterogeneity in instruments used to assess different dimensions of perfectionism. Such variability may undermine the consistency of findings and limit generalizability. Interventions targeting perfectionism have been measured with a variety of tools, including the Tehran Multidimensional Perfectionism Scale (TMPS), the Perfectionistic Self-Presentation Scale (PSPS), the Perfectionism Cognitions Inventory (PCI), and Hill's Perfectionism Questionnaire (HPQ), each capturing distinct facets of the construct. For instance, TMPS is oriented more toward internal processes based on cognitive schemas, whereas PSPS focuses on the outward, behavioral presentation of perfectionism. The MPS assesses perfectionism primarily from a cognitive perspective, emphasizing negative automatic thoughts, while HPQ—unlike many other instruments—aims to capture not only maladaptive but also functional dimensions of perfectionism. Accordingly, TMPS may be more suitable for evaluating dimensions related to internal motivation, personality traits, and individual schemas, whereas PSPS may be more functional for examining interpersonal processes such as social anxiety, shame, and social presentation. Because group-format interventions foreground the social expression of perfectionism, it is particularly important to select instruments that can capture behavioral responses in social contexts (e.g., PSPS) or perceptions related to external expectations (e.g., the Socially Prescribed Perfectionism subscale in TMPS). Third, especially among studies with clinical samples, the number of randomized controlled trials is insufficient, which limits the reliability of inferences regarding intervention effectiveness. In clinical samples, controlled comparisons would yield clearer and more valuable insights into how perfectionism manifests within target psychopathologies and how it should be addressed. Furthermore, many studies either lacked follow-up data or included only short-term follow-up, hindering evaluation of long-term effects. It is plausible that interventions targeting perfectionism may produce more pronounced effects over time; conversely, high effects at post-treatment may attenuate once contact with the group ends. This underscores the need for follow-up assessments to evaluate the durability and longer-term outcomes of treatment effects. Finally, imbalanced gender distributions (typically female-dominant) and small sample sizes in several studies may limit generalizability. Future research should adopt more homogeneous methodological approaches, recruit larger and more diverse samples, and develop protocols that evaluate long-term effects. In addition, individualized approaches may play an important role in overcoming limitations observed in clinical groups.

Moreover, the studies included in this review examined perfectionism in clinical and non-clinical samples without treating perfectionism itself as a formal diagnosis. In this regard, studies that evaluate the concept of "clinical perfectionism," develop group-based interventions that directly target clinical perfectionism, and test their effectiveness could substantially enrich the literature.

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Malignant catatonia triggered by acute psychological traumatic experience in a patient with schizophrenia: A case report

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SUMMARY

Malignant catatonia is defined as catatonia accompanied by hyperthermia and/or autonomic instability. Catatonia can develop in association with psychiatric disorders such as schizophrenia, bipolar disorder, and major depressive disorder, as well as various medical and neurological conditions. However, our knowledge regarding the role of acute traumatic experiences in the development of catatonia remains limited. This case report discusses a presentation of malignant catatonia triggered by an acute psychological trauma in a patient with schizophrenia in remission. A 41-year-old male patient has been followed with a diagnosis of schizophrenia since 2003. Following an acute psychological traumatic event, the patient developed withdrawal, reduced speech, refusal to eat and drink, and generalized rigidity. Upon examination, the patient exhibited catatonic stupor, rigidity, mutism, negativism, and vital signs indicating hyperthermia and hypertension. Based on these findings, a diagnosis of malignant catatonia was considered. The patient was administered electroconvulsive therapy. After eight sessions of electroconvulsive therapy, a significant improvement in the patient's clinical symptoms was observed. Traumatic experiences may contribute to the development of malignant catatonia through mechanisms such as acute threat perception, inflammatory responses, autonomic instability, and dysregulated dopaminergic signaling

Key words: Schizophrenia, catatonia, trauma

INTRODUCTION

Catatonia is a syndrome characterised with rigidity, mutism, posturing, immobility, negativism, repetitive behaviours, echolalia, echopraxia and waxy flexibility (1). Catatonia can be conceptualised as a spectrum. At one end there are milder forms called benign and at the other end there are more severe forms called malignant (2).

Malignant catatonia is defined as catatonia accompanied by hyperthermia and/or autonomic instability. Autonomic instability may manifest itself with symptoms including tachycardia, high or irregular blood pressure, diaphoresis, tachypnoea and cyanosis (3). Although historically associated solely with schizophrenia, it is now known that catatonia can also be caused by other psychiatric disorders such as bipolar disorder, major depressive disorder, and psychotic disorders. Additionally, various medical conditions, neurological diseases, and the use of neuroleptics can also trigger catatonia (4,5). A systematic review by Oldham reported that approximately 20% of catatonia cases have a medical cause. Among these, two-thirds are related to conditions affecting the central nervous system, including encephalitis, neural injuries, developmental disorders, structural brain diseases, and seizures (6). Other contributing factors include infections, metabolic disorders, endocrinopathies, and sudden withdrawal from alcohol or benzodiazepines, all of which can lead to catatonic states (7-9).

Although many factors have been identified in the literature about the etiology of catatonia, our knowledge about the role of acute stressors or traumatic experiences is limited. Although a limited number of cases have been reported in the literature regarding the role of acute traumas in the development of catatonia, there has yet to be a case report identifying acute traumas as a triggering factor for malignant catatonia. In this case report, we

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aimed to discuss the presentation of malignant catatonia triggered by an acute psychological trauma in a patient diagnosed with schizophrenia who had been in remission for the past five years.

Case

A.H.K. is a 41-year-old male patient. The patient's complaints first emerged in 2003, presenting as persecutory delusions, visual hallucinations, agitation, and insomnia. Approximately five months after the onset of symptoms, the patient underwent inpatient treatment in a psychiatric clinic for two months. The predominance of positive psychotic symptoms, the absence of mood disorder features, and the exclusion of any identifiable organic cause that could explain the clinical presentation supported the consideration of a diagnosis of schizophrenia. The patient was treated with olanzapine at a dosage of 5 mg/day until 2019, during which positive symptoms diminished; however, negative symptoms such as social isolation and avolition partially persisted. It was reported that the patient voluntarily discontinued olanzapine treatment in 2019 and experienced no changes in his syptoms until August 2024.

In August 2024, the patient was threatened by unfamiliar individuals while walking alone on the street and was kicked in the leg. The trauma experienced by the patient did not result in any physical injury. However, based on information obtained from the patient's mother, it was learned that the patient perceived the incident as a death threat and subsequently experienced severe anxiety and fear. Following the incident, he began to exhibit symptoms such as withdrawal, reduced speech, refusal to eat or drink, and rigidity throughout his body. Consequently, his family took him to the emergency department. In the evaluation conducted by the neurology department in the emergency room, no abnormalities were detected during the neurological examination aside from rigidity, and both the brain computed tomography (CT) and magnetic resonance imaging (MRI) were assessed as normal. The psychiatric evaluation indicated that the patient was unresponsive to external stimuli and remained motionless. The patient's level of consciousness was assessed as catatonic stupor. Limited cooperation, mutism, and a flat affect were observed. Due to mutism, an assessment of thought content could not be conducted. Additionally, the patient exhibited widespread muscle rigidity and negativism. The values outside the normal reference ranges in laboratory investigations were determined as follows: Creatine kinase (CK): 7370 U/L (reference range: 30-200 U/L), C-reactive protein (CRP): 31 mg/dL (reference range: 0-5 mg/dL), aspartate aminotransferase (AST): 465 U/L (reference range: 5-34 U/L) and alanine aminotransferase (ALT): 266 U/L (reference range: 0-55 U/L). The patient's initial examination revealed the following vital signs: body temperature 38.5°C, blood pressure 140/90 mmHg, and pulse rate 101 beats per minute. Based on the assessment of the patient's clinical and vital findings, a preliminary diagnosis of malignant catatonia was considered, and the patient was admitted to the psychiatry ward. Upon admission, the Bush-Francis Catatonia Rating Scale (BFCRS) score for the patient was calculated to be 27. The fact that the patient had not used antipsychotic treatment for the last 5 years contributed to the exclusion of neuroleptic malignant syndrome (NMS) in the differential diagnosis.

Due to the unavailability of lorazepam in Turkey for some time, the patient was started on a treatment regimen of diazepam at a dosage of 20-30 mg/day. During the first days of the patient's admission, the body temperature fluctuated between 38.5°C and 39.5°C, while the blood pressure ranged between 130/90 mmHg and 150/110 mmHg. The patient was consulted to the Internal Medicine department, hydration was recommended and antipyretic treatment was initiated. Due to elevated ALT and AST levels, a hepatobiliary ultrasound was performed. Following the absence of any pathological findings, N-acetylcysteine (NAC) 900 mg/day treatment was initiated upon the recommendation of the internal medicine department. The patient's ALT and AST levels gradually decreased within two weeks. On the fourth day of the patient's admission, in light of the lack of improvement in catatonic symptoms despite diazepam treatment, it was decided to proceed with electroconvulsive therapy (ECT). The patient was evaluated by the Neurology, Cardiology, Pulmonology, and Anesthesiology and

Reanimation departments. The patient underwent a total of eight sessions of bilateral ECT, administered three times a week. Following the second application of ECT, a significant improvement in the patient's catatonic symptoms was observed. The patient began to speak in short sentences, exhibited improvement in affect, and started consuming liquid foods. Following the eighth session of ECT, the patient began to walk and speak fluently, exhibited a reduction in rigidity, and normalized oral intake. During the patient's hospitalization, hemogram, electrolyte levels, liver function tests, and kidney function tests were closely monitored. The CK level decreased to 108 U/L, the CRP level to 5 mg/dL, the AST level to 28 U/L, and the ALT level to 41 U/L, all returning to normal reference ranges. The patient, who exhibited a reduction in catatonic symptoms and was assessed with a BFCRS score of 0, was discharged on the 30th day of hospitalization.

DISCUSSION

Particularly, it has been discussed through various cases that acute stressors and traumatic experiences can trigger catatonic states. Such conditions are commonly associated with psychiatric disorders such as post-traumatic stress disorder (PTSD) or acute emotional stress (10-13). However, there have been no case reports in the literature regarding the development of malignant catatonia based on acute traumatic experiences. This case underscores the potential of acute traumatic stress to trigger severe psychiatric disorders, including malignant catatonia.

The association between traumatic experiences and the onset of malignant catatonia is complex and not yet fully elucidated. Several mechanisms have been proposed to explain this relationship; however, these explanations primarily focus on how acute stress factors contribute to the development of catatonia (14). Traumatic experiences, may heighten vulnerability to catatonia through pro-inflammatory mechanisms and dysregulated threat processing in the amygdala (15). Increased cytokine activity is thought to be a significant factor in the emergence of sickness behavior by suppressing dopamine production and function in the reward system (16). Sickness behavior is a behavioral response pattern characterized by symptoms such as apathy, psychomotor slowing, loss of interest and appetite, and occasionally fever, reflecting a strategy aimed at conserving energy. This model shares similarities with certain aspects of conditions such as catatonic stupor (17). Another explanation is that in situations of acute fear or stress, an individual may enter a catatonia-like state when perceiving that there is no possible escape to ensure safety. This phenomenon resembles an acute fear response observed among mammals and birds, known as the 'freezing' or 'playing dead' reaction. This response has been associated with a mechanism involving the activation of the vagus nerve (18). In addition to these mechanisms, autonomic nervous system dysfunction, manifesting as sympathoadrenal hyperactivity, is considered a potential underlying mechanism in the relationship between acute traumatic experiences and malignant catatonia. Acute traumatic experiences can lead to autonomic instability by overactivating the sympathoadrenal system, dysregulating the HPA axis, disrupting neurotransmitter homeostasis, triggering neuroinflammatory processes, and impairing vagal tone. These physiological alterations collectively contribute to an increased susceptibility to malignant catatonia (19). In individuals with a history of trauma, the interplay between acute threat perception, inflammatory responses, autonomic instability and dysregulated dopaminergic signaling may trigger malign catatonia as a maladaptive defensive mechanism.

In conclusion, acute trauma or traumatic life events can trigger catatonic presentations, particularly in individuals who are already at psychiatric risk. Given the serious risks associated with malignant catatonia, particularly the high rates of morbidity and mortality, it is crucial to recognize and assess the presence of acute traumatic experiences in patients, as well as to intervene early in such situations.

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