NÖRO PSİKİYATRİ ARŞİVİ
ARCHIVES OF NEUROPSYCHIATRY

RESEARCH ARTICLE

Arch Neuropsychiatry 2020;57:27–32
https://doi.org/10.29399/npa.23610

Comparison of the Emotion Regulation and Temperament Characteristics Between Depressive Patients With and Without Mixed Features

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ABSTRACT

Introduction: "Depressive disorder with mixed features" has been included in the official classification in the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Hypothesizing that difficulties in emotion regulation and affective temperament scores are higher in mixed depression comparing to pure depression, we aimed to evaluate the relationship between these phenomena and mixed symptoms.

Methods: Depressive patients diagnosed by a psychiatrist according to the DSM-5 and had not received any psychiatric treatment for the last 3 months, were included in the study. The Hamilton Rating Scale (HDRS), modified Hypomania Checklist (mHCL), Difficulties in Emotion Regulation Scale (DERS), and the TEMPS-A (Temperament Evaluation of Memphis, Pisa, Paris, San Diego Autoquestionaire) were applied to all participants.

Results: Of the 63 participants, 40 (63.5%) were women. The mean age was 37.8±12.4 years while mean duration of education was 10.8±4.3 years. The proportion of mixed-depression assessed by the mHCL was 23.8% (n=15). No significant difference was found between the groups concerning gender, age, family history, age at onset of illness, the total number of episodes and temperament scores. Depressive patients with mixed features had significantly higher DERS nonacceptance subscale scores. Multiple regression analysis demonstrated that the cyclothymic temperament scale scores significantly affected the total mHCL scores.

Conclusion: In mixed depression group, higher scores in nonacceptance subscale seems to reflect a tendency to fluctuations in the emotional reactions of a person to the stress. Association between mixed depression, DERS nonacceptance subscale and cyclothymic temperament support the spectrum view that mixed depression is placed between pure depression and bipolarity.

Keywords: Depression, mixed features, emotion regulation, affective temperament

Cite this article as: Taş Hİ, Altınbaş K. Comparison of the Emotion Regulation and Temperament Characteristics Between Depressive Patients With and Without Mixed Features. Arch Neuropsychiatry 2020;57:27-32.

INTRODUCTION

The ability to regulate one's emotional state is an essential requirement for managing problems, difficulties, and concerns. Empirical research supports that differences in emotional regulation processes are associated with the development of specific psychopathologies (1). For depression as the second leading cause of disability worldwide, it was reported that patients can not regulate negative emotions (2). Besides, it is reported that individuals in depression use non-functional strategies for emotion regulation such as rumination, distraction, and self-blame (3). Therefore, differences in these emotion regulation process could lead to various clinical manifestations of depression.

Mixed features and anxious distress are newly added specifiers for a depressive episode in the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (4). If an individual full fills the depressive episode criteria and at least three accompanying (hypo) manic symptoms is present such as elevated mood, inflated self-esteem, decreased need for sleep and an increase in energy or goal-directed activity, then mixed features specifier should be considered according to the DSM-5 (4). Many studies have reported increased amount of speech, irritability, flight of ideas or racing thoughts, increased psychomotor activity, and distractibility as the most common manic symptoms in mixed depression (5). Depression with mixed features is associated with family history bipolar disorders, early age of illness onset, longer duration of illness, unresponsiveness to the antidepressant, antidepressant induced manic switch, treatment that are also reported to be associated with bipolarity (6).

On the other hand, affective temperament is an another phenomenon that predispose to the emergence of mood fluctuations and thought to be subclinical manifestation of mood disorders (7). Many authors claim that affective temperament should be considered as an endophenotype for mood disorders and there are specific affective temperament characteristics for each mood disorder (8, 9). Mania was primarily reported to be associated with hyperthymic temperament, while depression was

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Received: 27.01.2019, **Accepted:** 25.08.2019, **Available Online Date:** 12.09.2019
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found to be related to depressive temperament (10). Many studies have been conducted to evaluate the impact of affective temperament on the prognosis and clinical appearance of mood disorders. Some specific factors such as early age of illness onset, predisposition to antidepressant induced manic switch, recurrence of episodes are noteworthy for the mood disorder-temperament relationship (11–13).

In the light of this evidence, hypothesizing that the affective temperament features and emotion regulation disorders in depressive patients with mixed features are different from pure depression, we aimed to evaluate the relationship between these phenomena and mixed symptoms.

METHODS

Sampling

The study included 63 patients in the depressive period who were not receiving any psychiatric treatment for the last three months and were diagnosed in the outpatient clinics of Çanakkale Onsekiz Mart University Faculty of Medicine as having depression according to the DSM-5 criteria. Participants under 18 years of age, those who did not agree to participate in the study, and patients with cognitive problems that would not allow to fill the self-rated tools appropriately were excluded from the study. Also, patients diagnosed with bipolar disorders (n=6), anxiety disorders (n=14), schizoaffective disorder (n=1), substance use disorders and related conditions (n=5) or schizophrenia and other psychotic disorders were excluded from the study. During the data collection phase, the purpose of the research was explained, and written approval was obtained from the volunteers. Ethical approval of the study was obtained from the local ethics committee at Çanakkale Onsekiz Mart University Faculty of Medicine (Date: 02.11.2016, number 18920478–050.01.04-E. 125108).

Data Collection Tools

The following data collection tools were applied to patients who underwent a clinical evaluation and met the diagnostic criteria of the depressive episode according to DSM-5:

1. The Modified Hypomania Checklist (mHCL): Hypomania Checklist (HCL-32) is a self rating screening tool for bipolar disorders via detecting lifetime (hypo) manic symptoms (14). mHCL-32 was adapted from HCL-32 by changing its primary property from a diagnostic screening instrument to a tool to assess for concurrent mixed symptoms of depression (15).
2. The Difficulties in Emotion Regulation Scale (DERS) developed by Gratz and Roemer (2004). The DERS consists of Nonacceptance of Emotional Responses (Nonacceptance), Difficulties Engaging in Goal-Directed Behavior (Goals), Impulse Control Difficulties (Impulse), Lack of Emotional Awareness (Awareness), Limited Access to Emotion Regulation Strategies (Strategies), and Lack of Emotional Clarity (Clarity) subscales (16). The scale consists of 36 items and Turkish reliability and validity study of the scale was done by Ruganci and colleagues in 2010. There is no cut-off point for the scale since subcategories were evaluated independently (17).
3. TEMPS-A (Temperament Evaluation of Memphis, Pisa, Paris, San Diego Autoquestionaire) Temperament Scale. The TEMPS-A was designed by Akiskal et al. to measure the dominant affective temperament. The original scale has 110 items for women and 109 items for men (18). The Turkish version of the scale consists of 100 items to determine depressive, hyperthymic, irritable, and anxious temperaments. The Turkish version of the TEMPS-A was used primarily to determine temperament characteristics and to compare the temperament characteristics of the specific patient groups. No total cut-off point was indicated for the TEMPS-A scale. However, there is cut-off point to determine each dominant temperament sub-category (19).
4. To measure the severity of depression, the Hamilton Depression Rating Scale-17 item (HDRS-17) was administered by the clinician (20). Turkish reliability and validity study of the HDRS-17 was done by Akdemir and colleagues in 1996 (21).

Additionally, the clinician applied a structured sociodemographic form to all participants querying age, gender, duration of illness, accompanying comorbidities, and drug use. This study must recruit 49 cases to have 80% power with 5% type 1 error level to detect a minimum clinically significant difference when the expected prevalence of depression in adults is 15% and 3% for mixed depression.

Statistical Analysis

Data were analyzed with the SPSS Package Program version 19.0. Frequencies, percentage, mean, and standard deviation were used in the presentation of descriptive data. The Chi-Square test was used to compare categorical data. The normal distribution of quantitative data was evaluated by the Kolmogorov-Smirnov Test. In the analysis of the quantitative data, the independent samples t-test or Mann-Whitney U Test was used depending on the distribution of the variables. The Pearson correlation test was used normally distributing variables, while the Spearman correlation test was done for skewed variables. Correlation coefficient (r) was classified as weak (0.00–0.24) intermediate (0.25–0.49), strong (0.50–0.74), and very strong (0.75–1.00). A multiple regression analysis was done to determine factors affecting the total mHCL scores, where TEMPS-A and HDS scores were taken as independent variables. A p-value <0.05 was accepted as statistically significant.

RESULTS

Socio-Demographic and Clinical Features of the Sample

Mean age of the participants was 37.8±12.4 years. Of the 63 participants, 63.5% (n=40) were women. Thirty-five 55.6% individuals were married, while 33.3% (n=21) were single. 68.3% (n=43) participants were living with their nuclear family, and 30.2% (n=19) were living alone. 52.4% (n=33) participants (were unemployed; 28.6% (n=18) had a psychiatric family history.

The mean duration of education and the mean age at the time of the first diagnosis of depression was 10.8±4.3 years and 28.0±9.6 years, respectively. For those having more than one depressive episodes, the duration of remission has been 15.6±19.0 months since the last depression period. The mean scores of the scales are summerized in Table 1.

Comparison of Mixed and Pure Depression

Individuals scored ≥13 on mHCL-32 scale were included in the mixed-type depression group (n=15, 23.8%), and those scoring <13 were included in the pure depression group (n=48, 76.2%). There was no significant difference between the groups regarding gender, working status, and family history (Table 2). When we evaluated the proportion of each item of mHCL, most common five items were as follows; first, *"I drink more coffee and/or tea"* (62%, n=39); second, *"I am more inpatient and/or get irritable more easily"* (56%, n=35); third, *"I am more easily distracted"* (54%, n=34); fourth, *"I can be exhausting or irritating for others"*(48%, n=30) and fifth, *"I get into more quarrels"*(32%, n=20).

When the patient group with mixed features and pure depression were compared, no significant difference was found in terms of age, the age of onset of the disease, the total number of episodes, duration since the last remission, and temperament scores (p>0.05). However, there was a significant difference between the groups concerning DERS Nonacceptance subscale scores (p<0.05) (Table 3).

Table 1. Demographic characteristics and scale scores of the study group

Variable	Mean ± SD	Median (min-max)
Duration of education (years)	10.8±4.3	11.0 (4.0–18.0)
Age when the disease started (year)	28.0±9.6	25.0 (16.0–59.0)
Age (year)	37.8±12.4	37.0 (19.0–65.0)
Total number of episodes	2.9±1.8	2.0 (1.0–8.0)
Duration since last remission (months)	15.6±19.0	12.0 (2.0–120.0)
Total HDRS score	18.9±7.3	18.0 (7.0–39.0)
Total mHCL score	9.4±5.5	8.0 (2.0–25.0)
Depressive temperament	9.2±4.6	9.0 (1.0–19.0)
Cyclothymic temperament	8.9±4.8	8.0 (1.0–18.0)
Hyperthymic temperament	6.8±4.4	7.0 (0.0–16.0)
Irritable temperament	6.8±4.2	7.0 (0.0–15.0)
Anxious temperament	10.6±6.5	10.0 (0.0–24.0)
DERS Nonacceptance	17.6±5.4	18.0 (7.0–28.0)
DERS Goals	17.4±4.3	17.0 (6.0–25.0)
DERS Impulse	17.8±5.2	18.0 (6.0–29.0)
DERS Awareness	12.8±3.8	12.0 (6.0–24.0)
DERS Strategies	25.4±6.7	25.0 (10.0–39.0)
DERS Clarity	15.3±2.7	15.0 (10.0–22.0)

SD, standard deviation; HDRS, Hamilton depression rating scale; mHCL, modified hypomania checklist; DERS, difficulties in emotion regulation scale.

Table 2. Comparison of groups according to the depression type

	Pure depression (n=48)	Mixed-features depression (n=15)		
	% (n)	% (n)	χ^2	p
Sex			0.360	0.549
Female	60.4 (29)	73.3 (11)		
Male	39.6 (19)	26.7 (4)		
Employment			0.947	0.331
Unemployed	47.9 (23)	66.7 (10)		
Employed	52.1 (25)	33.3 (5)		
Family history			-	0.330*
No	75.0 (36)	60.0 (9)		
Yes	25.0 (12)	40.0 (6)		

%, column percentage; *Fisher's exact test.

Table 3. Comparison of demographic characteristics and scale scores between mixed-features and pure depression groups

	Pure (n=48)	Mixed (n=15)		
	Mean ± SD	Mean ± SD	U/F	p
Age of onset of disease	27.9±9.9	28.5±8.8	334.5	0.680
Age (years)	38.2±12.3	36.7±13.1	346.5	0.827
Total number of episodes	2.9±1.7	2.9±2.4	329.5	0.614
HDS score	18.7±7.7	19.5±6.2	1.034	0.714*
Depressive temperament	9.2±5.1	9.3±2.9	5.174	0.875*
Cyclothymic temperament	8.3±4.5	10.7±5.2	0.941	0.089*
Hyperthymic temperament	6.8±4.5	7.0±4.4	0.048	0.875*
Nervous temperament	6.4±4.2	7.9±4.1	290.0	0.257
Anxious temperament	10.4±6.3	11.3±7.1	0.137	0.613*
DERS Nonacceptance	16.9±5.7	19.7±3.9	4.889	0.035*
DERS Goals	17.2±4.4	18.3±3.8	1.113	0.379*
DERS Impulse	17.7±5.2	18.1±5.4	0.107	0.808*
DERS Awareness	12.9±3.8	12.6±3.6	338.0	0.721
DERS Strategies	24.8±6.6	27.2±6.6	0.003	0.224*
DERS Clarity	15.1±2.7	15.9±2.7	0.801	0.363*

SD, standard deviation; HDRS, Hamilton depression rating scale; DERS, difficulties in emotion regulation scale; p, Mann-Whitney U test; p*, independent samples t-test; U and F values were given for Mann-Whitney U and independent samples t-test respectively.

Evaluation of the Associations Between Depression, Emotion Regulation, and Temperament Characteristics

Correlation analysis evaluating the associations between the HDRS, DERS, TEMPS-A, and mHCL scale scores demonstrated that the total HDRS scores had an intermediate relationship with depressive, cyclothymic, and irritable temperament scores, and showed a strong correlation with the anxious temperament scores (r values 0.482, 0.369, 0.469, and 0.613, respectively, $p<0.05$). On the other hand, the HDRS scores showed strong correlations with the DERS subscores of nonacceptance, goals, impulse, and strategies and intermediate-level positive associations with the awareness and clarity subscale scores (r values, 0.534, 0.543, 0.506, 0.562, 0.291, and 0.367, respectively, $p<0.05$). An intermediate-level positive correlation was found between the total scores of mHCL scores and cyclothymic temperament ($p=0.006$, $r=0.341$).

There was an intermediate-level positive correlation between the depressive temperament scores and the subscale scores of the DERS nonacceptance, goals, and strategies (r values 0.333, 0.464, and 0.428, respectively, $p<0.05$). Also, an intermediate-level moderate positive correlation was found between the cyclothymic temperament scores and the DERS nonacceptance, impulse, awareness, strategies and clarity subscale scores (r values 0.379, 0.299, 0.317, 0.298, and 0.372, respectively, $p<0.05$). An intermediate-level positive correlation was found between the nervous temperament scores and the goals, impulse, strategies and clarity DERS subscale scores (r values 0.407, 0.261, 0.428, 0.430, and 0.392 respectively, $p<0.05$).

Table 4. Regression analysis between mHCL, temperament and depression scale scores

Variables	Beta	P	B	95% CI (B)	
Constant		0.131	8.298	-2.548	19.145
Depressive temperament	*-0.098*	*0.597*	*-0.117*	*-0.557*	*0.323*
Cyclothymic temperament	0.403	0.024*	0.467	0.065	0.869
Hyperthymic temperament	0.050	0.724	0.063	-0.293	0.419
Irritable temperament	0.047	0.781	0.062	-0.385	0.510
Anxious temperament	-0.083	0.705	-0.071	-0.445	0.303
HDRS Score	-0.085	0.599	-0.064	-0.308	0.179

*p<0.05 is statistically significant; CI, confidence interval; p, multiple regression analysis; Dependent variable, modified hypomania checklist (mHCL) total scores; HDRS, Hamilton depression rating scale score.

The multiple regression analysis demonstrated that the cyclothymic temperament scale scores significantly affected the total mHCL scores. Each unit of increase in the cyclothymic scale score increased the mHCL score by 0.444 (95% CI 0.035–0.853). (Table 4)

DISCUSSION

Approximately one fourth (23.8%, n=15) of the 63 depressive patients met the symptoms of depression with mixed features. In a study conducted on 1176 patients having major depressive disorders, 26.8% of the subjects screened with the HCL-32 had hypomanic periods (22). The multicenter study published by the BRIDGE-II-MIX study group in 2015, included 2811 adult patients diagnosed with major depressive episodes. According to the DSM-5 criteria, the rate of individuals who met the criteria for mixed characteristics depression was reported as 7.5%. However, the ratio of mixed characteristics not focused on the DSM-5 criteria was reported as 29.1% (23). Another study evaluating mixed symptoms in depressive episodes in patients with a major depressive disorder and bipolar disorder included 982 individuals. The study categorized patients with at least three symptoms from the Young Mania Rating Scale as having mixed features. Accordingly, 26% of patients with MDD and 33.9% of patients with bipolar disorder were reported to have mixed characteristics (24). In our study the proportion of mixed depression was relatively lower than the literature. However, the most common hypomanic symptoms in depression was in line with the literature (14). Relatively lower rates in our study might be related with the high HCL-32 scale cut-off scores that we used to define mixed depression. The fact that we did not make a grouping according to the presence of ≥3 (hypo) manic symptoms from the opposite pole as to the definition of mixed symptom depression described by the DSM-5 can be considered as a limitation of this study. Besides, statistical analysis of relatively small number of patients with mixed depression related with the total sample size may cause to a type-2 error. This should be considered as an another limitation of our study.

On the other hand, another important finding of our study is the higher cyclothymic temperament scores in the depression group with mixed symptoms than those with pure depression. It is reported that mixed symptom depression is more difficult to treat, has a clinical picture with early onset, antidepressant induced manic switch, more severe symptoms of depression, more frequent recurrence, positive family history and more comorbidities (25), (26) and a significant proportion of mixed depressive patients (approximately 13–20%) meet the diagnostic criteria for bipolar disorder in the course of the process (6). Considering that temperament characteristics are a subclinical form of mood disorders (27, 28), the more obvious observation of cyclothymic temperament characteristics, which can be defined as the subclinical form of bipolar disorder in patients with mixed depressive symptoms, becomes even more significant. As a matter of fact, 1921 patients with MDD and 1178 patients with BPD were enrolled in a study evaluating mixed symptoms with temperament characteristics. Individuals with mixed characteristics had significantly more cyclothymic and irritable temperament characteristics. These temperament characteristics were observed not only in individuals with the major depressive disorder but also in individuals with depression and bipolar disorder (29). In our study, higher scores of cyclothymic temperament which is thought to be subclinical form of bipolar disorders (8) were found in individuals with mixed depression than pure depression group. This could indicate that mixed depression is a transitory clinical form between major depression and bipolar disorders (24, 25, 29). However, individuals who were diagnosed with bipolar disorder were excluded and only individuals with a major depressive disorder were included in our study. Cross-sectional pattern of our research makes it difficult to make further comments. Long-term follow-up studies are required to determine the occurrence of bipolar disorder in patients with mixed depression and cyclothymic temperaments.

Another dimension we considered in our study is emotion regulation. The DERS nonacceptance subscale score was found to be higher in the mixed-symptoms group compared to pure depression. The condition is defined with dimensions of difficulty in regulating emotions, the lack of awareness of emotions, the inability to understand and accept emotions, difficulty in controlling impulses and orientation towards goal-oriented behaviors when experiencing negative emotions, and the difficulty in accessing harmonic emotion regulation methods (17). The DERS subscale "not accepting emotional responses" shows the difficulty of the person in accepting emotional responses towards experienced stress (e.g., "I am embarrassed for feeling this way when I am sad") (16). In a study comparing individuals with unipolar depression, anxiety disorder, and euthymic bipolar disorder using the DERS, subscale scores in patients with euthymic bipolar episodes proved to be less affected than the unipolar depression or anxiety groups concerning emotional awareness, nonacceptance of emotions, and understanding emotions (30). In a study categorizing patients with bipolar disorder according to the presence of euthymic, depressive, and hypomanic symptoms, the groups were compared with a control group using the DERS, which demonstrated that all subscale scores except awareness were higher in patients with bipolar disorder. It was reported that the DERS subscale score related to impulse control predicted hypomanic symptoms, and the limited access to emotion regulation strategies subscale predicted depressive symptoms (31). The "nonacceptance" of the person's emotional response to stress may prevent him from regulating his feelings against negative stimuli in a balanced way. This can cause a person to experience rapid and unexpected mood swings in response to stress. Similar mood swings occur in bipolarity. Considering that the mixed feature depression is located at the unipolar-bipolar junction, it can be thought that individuals who have difficulty in accepting their emotional reactions should be monitored for bipolarity. Since our research is cross-sectional, it is not possible to estimate the transformation to bipolarity. Besides, considering the fact that the number of manic symptoms increases in depressed patients receiving antidepressant treatment (32), it is evident that there is a need for follow-up studies in which these individuals are evaluated longitudinally. We believe that there is a need for new research describing and comparing the different clinical features of mixed and

pure depression. Because information and publication are very new in this field, our research may have significant contributions to the available knowledge.

CONCLUSION

In our study, we verified that people with depressive episodes with and without mixed symptoms had differences in terms of affective temperament characteristics and emotion regulation. It is reported in different studies that mixed depression could be located somewhere between pure unipolar depression and bipolar disorder, and a significant number of these patients are later diagnosed with bipolar disorder. We think that the cyclothymic temperament characteristics and emotion regulation nonacceptance subscale scores pronounced in mixed depression are valuable from this perspective. To the best of our knowledge, this study is the first study that evaluates the relation of affective temperament and emotion regulation with pure and mixed depression. Therefore, we believe that our findings will provide a framework for future studies aiming to understand the clinical mediators of mixed depression. Nevertheless, longitudinal follow-up studies with larger sample size are required to clarify the role of temperament and emotion regulation in mixed depression.

LIMITATIONS

Our study has some limitations. First, due to the cross-sectional design of the study, the temporal relations between the clinical variables and mixed depression cannot be determined. Second, total sample size is relatively small. Third, we did not measure metabolic parameters that might be related with mixed depression such as thyroid functions. Fourth, the sample may not be fully representative of the population due to the number of people included and the fact that it is conducted among individuals applying to a university hospital. Lastly, taking cut-off points of mHCL-32 scale as a criterion rather than strict DSM-5 criteria for mixed depression may also be considered as a limitation. However, to the best of our knowledge our study is the first in evaluating mixed symptoms in major depressive episode together with temperament characteristics and difficulties in emotion regulation.

Ethics Committee Approval: Ethical approval of the study was obtained from the local ethics committee at Çanakkale Onsekiz Mart University Faculty of Medicine (Date: 02.11.2016, number 18920478–050.01.04-E. 125108).

Informed Consent: During the data collection phase, the purpose of the research was explained, and written approval was obtained from the volunteers.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - HİT, KA; Design - HİT, KA; Supervision - HİT, KA; Resource - HİT, KA; Materials - HİT, KA; Data Collection and/ or Processing - HİT; Analysis and/or Interpretation - KA; Literature Search - HİT, KA; Writing - HİT, KA; Critical Reviews - HİT, KA.

Conflict of Interest: We have no conflict of interest for the article.

Financial Disclosure: There is no financial conflicts of interest to disclose.

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