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# DIMENSIONAL PERSONALITY MODEL CHARACTERISTICS OF FEMALE ADOLESCENTS WITH MAJOR DEPRESSIVE DISORDER

MAJOR DEPRESİF BOZUKLUK TANILI KIZ ERGENLERİN BOYUTSAL KİŞİLİK MODEL ÖZELLİKLERİ

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## Abstract

Given the lack of studies focusing on this topic, we aimed to evaluate the dimensional personality characteristics of adolescents with Major Depressive Disorder based on the DSM-5 and to determine the relationship between pathological personality traits and psychopathology.

This study was done in Turkish population and data of 70 female patients ranging in age between 11 and 18, who were admitted to the Child and Adolescent Psychiatry outpatient clinic with depressive symptoms, was analyzed. We cross-sectionally analyzed DSM-5 Personality Inventory Child Form-Short Version (PID-5-CSV) dimensional scores and the correlation between PID-5-CSV and Beck Depression Inventory (BDI) scores, and compared the PID-5-CSV features between depression severity groups that were formed based on the BDI cut-off ranks.

A positive correlation was found between depression severity and total scores of the PID-5-CSV, indicating an increased risk of personality psychopathology. Some of the dimension scores were also positively correlated with BDI scores, putting these patients at risk for specific personality disorders (PD), especially Borderline PD. Significantly lower Antagonism dimension scores were found, which has not been reported in the literature before; this may indicate a possible risk factor for Avoidant PD.

Results from this study may suggest that the PID-5-CSV is an effective way to assess personality traits and implement dimensional personality characteristics into the psychiatric diagnosis and treatment process. Studies with control groups and mixed gender samples are needed for further clarification in this field.

Keywords: depression, personality, DSM-5

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## Öz

Bu alanda yapılmış olan çalışmaların kısıtlı olduğu göz önünde bulundurularak çalışmamızda; Major Depresif Bozukluk tanısı olan kız ergenlerin kişilik özelliklerinin DSM-5 Boyutsal Modeli'ne göre değerlendirilmesi ve patolojik kişilik özellikleri ile psikopatoloji arasındaki ilişkinin araştırılması amaçlanmıştır.

Çalışma kapsamında Çocuk ve Ergen Psikiyatrisi polikliniğine depresif bulgular ile başvuran, yaşları 11 ile 18 arasında olan toplam 70 kız ergenin verileri değerlendirilmiştir. Kesitsel olarak DSM-5 Kişilik Envanteri Çocuk Formu-Kısa Versiyonu (KED-5-ÇKV) boyut puanları ile Beck Depresyon Envanteri (BDE) puanları arasındaki ilişki araştırılmış ve KED-5-ÇKV özellikleri BDE kesme değerlerine göre belirlenen depresyon şiddeti grupları arasında karşılaştırılmıştır.

Depresyon şiddeti ile KED-5-ÇKV toplam puanları arasında saptanan pozitif korelasyon, kişilik psikopatolojileri açısından yüksek riski göstermektedir. Bazı alt boyut puanlarının da BDE puanlarıyla ilişkili saptanması bu olguların, başta Borderline Kişilik Bozukluğu (KB) olmak üzere, birçok KB açısından riskli durumda olduklarını göstermektedir. Saptanan belirgin düşük Karşıtlık puanları ise daha önce yazında belirtilmemiş bir bulgudur ve gelişebilecek Kaçıngan KB riskini gösteriyor olabilir.

Çalışmamızın sonuçları KED-5-ÇKV'nin; kişilik özelliklerinin değerlendirilmesi ve boyutsal kişilik özelliklerinin psikiyatrik tanı ve tedavi sürecine dahil edilmesi kapsamında oldukça etkin olduğunu göstermektedir. Bu alanda daha belirgin sonuçlara ulaşmak için hem kız hem erkeklerden oluşan ve kontrol grubu içeren çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: depresyon; kişilik; DSM-5

#### 1. Introduction

Although Major Depressive Disorder (MDD) is one of the most common psychiatric disorders in childhood and adolescence, the rate of diagnosis and treatment is insufficient due to the fact that the symptomatology is different in this age group than it is in adults (Mullen, 2018). Genetic predisposition, early negative life events, negative cognitive patterns, maladaptive schemas, intensity of negative affect, lack of positive affect, and behavioral inhibition may play a role in the development of MDD (Garber, 2006). Several studies have also shown that psychiatric disorders, such as depression, may lead to distortion of existing schemas (Rudolph et al., 2000). It has been emphasized that even after the clinical findings of depression have improved, a negative thought pattern tends to continue; specifically, the negative cognitive schemas that occur as a result of depression in adolescence are the most important predictive factors for future episodes of depression (Tram & Cole, 2006). The negative cognitive schemas, interpersonal relational difficulties, and environmental factors seen in MDD may result in pathological personality patterns. It has long been believed that certain pathological personality traits may be associated with more serious psychopathologies, especially MDD (Jackson, 1986). Many approaches and models have been proposed to define the structures that form and determine personality patterns. Eysenck suggested that three factors, Neuroticism (N), Extraversion (E), and Psychotism, define the personality structure (Eysenck & Eysenck, 1985). The Five Factor Model (FFM) is another model that explains the personality structure. Although these five factors are referred to in many different ways, the most commonly used nomenclature is: N, E, openness, agreeableness, and conscientiousness, which are described in Costa and McCrae's study (Costa & McCrae, 1985).

Pathological personality traits, which can cause functional impairment, are defined as personality disorders (PD) (Bernstein et al., 2007). It has been stated that the DSM-IV-TR PD classification system has some problems, such as the lack of diagnostic accuracy and the lack of evidence of validity for some types of PDs (Grilo et al., 2001).

Due to high psychiatric disorder comorbidity rates, high heterogeneity among patient groups within the same PD diagnosis, and the uncertainty of the parameters in the diagnosis criteria (Grilo et al., 2001), many researchers, especially Harkness et al. (2014), have presented new recommendations for the dimensional properties of PDs for DSM-5 classifications (Krueger; 2013; Harkness et al., 2014). Although these recommendations were not included in the DSM-5 PD diagnostic system and the DSM-IV-TR PD diagnostic classification was preserved, they were placed under DSM-5 Section 3 for further research. The Dimensional Personality Model that constitutes the DSM-5 Personality Inventory (PID-5) includes five main dimensions: Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychotism (Krueger et al., 2011).

Since the DSM-III was published, the main objective of incorporating the personality axis into diagnostic systems is to be able to offer more specific treatment options by considering individual patient differences (Frances & Clarkin, 1981). However, the literature on the use of the PD diagnostic system in the process of treatment modification is limited. Even though it is known that patients with PD have worse treatment responses than those without, recommendations about which specific treatment option should be selected for which type of PD are insufficient (Shea et al., 1990). While clinicians make complex decisions by considering many cognitive, behavioral, interpersonal, and dynamic factors regarding the treatment of people with PD, it is difficult to say that they use PD type as a guide (Verheul, 2005).

When the literature is examined, the DSM-5 Dimensional Personality Model's effectiveness in clinical use and its relationship with the Axis I psychopathologies defined in the DSM-IV-TR are limited; moreover, no previous research studies have been conducted in the adolescent age group. Thus, the present study is the first to evaluate female adolescents who have been diagnosed with MDD and who have no history of psychiatric drug use or comorbid psychiatric disorders. We aimed to examine the personality traits of these patients using the DSM-5 dimensional approach, to clarify the limitations observed

in the literature in this field, and to present personality dimensions to clinicians as diagnostic factors by defining their relation to MDD.

#### 2. Methods

#### 2.1. Sample and Procedures

Within the scope of our study, a total of 107 female patients ranging in age between 11 and 18, who were admitted to the Child and Adolescent Psychiatry outpatient clinic with depressive symptoms in a 1 year time period, were evaluated. None of the participants received any treatment (medication or therapy) before inclusion to the study. All of the participants gave their informed consent prior to their inclusion in the study. This study has been approved by the ethics committee of the institution in which the study was conducted and has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. In the psychiatric interviews, trained clinicians used the Schedule for Affective Disorders and Schizophrenia for School Aged Children Kiddie-SADSlifetime Version (KSADS-PL) (Kaufman et al., 1997); in 33 cases, other psychiatric disorders (anxiety disorders, post-traumatic stress disorder, etc.) were comorbid with MDD; in 74 cases MDD was diagnosed exclusively. Patients with comorbid psychiatric disorders were not included in the study, and four patients were excluded from the study because they could not cooperate with the scales used. Consequently, a total of 70 patients with pure MDD diagnosis were evaluated.

#### 2.2. Measures

The Beck Depression Inventory (BDI) was used to evaluate the severity of the patients' depression. This scale, developed by Beck et al., is a 21-item self-report scale that assesses the depressive symptoms perceived by the patient; it measures symptoms in the vegetative, emotional, cognitive, and motivational areas of depression (Beck et al., 1961). Each symptom category consists of four self-assessed items, and higher scores indicate more severe depressive symptoms. Patients participating in our study were divided into categorical groups based on their BDI scores in accordance with the cutting values specified in the literature. Patients with BDI scores between 10-16 were categorized as mildly depressed, those with BDI scores between 17-29 were categorized as moderately depressed, and those with BDI scores between 30-63 were categorized as severely depressed (Beck et al., 1988). In the study done by Hisli, the validity and reliability of the scale in the Turkish language showed sufficient results in children and adolescents (Hisli, 1989).

The Dimensional Personality Model characteristics listed in Section 3 of DSM-5 were evaluated using the DSM-5 Personality Inventory Child Form-Short Version (PID-5-CSV). This 25-item self-report scale is used to evaluate personality traits in children and adolescents ranging in age between 11 and 18. The PID-5-CSV consists of five main personality dimensions: Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychotism. Each dimensional area consists of five sub-dimensions. The child is asked to evaluate how well each item defines himself/herself. Items in the scale provide a quaternary Likert-type evaluation (0 = too incorrect or often incorrect; 1 = sometimes or slightly incorrect; 2 = sometimes or slightly correct; 3 = very accurate or often correct). The total score ranged from 0 to 75, while the total sub-score for each personality dimension ranged from 0 to 15. Higher scores indicate greater personality dysfunction. The Cronbach alpha internal consistency coefficient was 0.776, and the test- retest correlation coefficient was 0.600 (p <0.0001) in the validity and reliability study of the scale in the Turkish language (Yalın Sapmaz et al., 2017).

#### 2.3. Data Analysis

Means and standard deviations (SD) are given for the normally distributed variables. Medians and interquartile ranges (IQR) are presented for the non-normally distributed variables. Numbers and percentages are given for the categorical variables. To evaluate the PID-5-CSV results, Total Partial Raw Scores (TPRS) were calculated if all of the questions were answered and Equally Distributed Total Scores (EDTS) were calculated if any of the questions were not answered. Moreover, the Average Total Scores (ATS) of the subjects, which reflects the overall status of the patient relative to the maximum score, were calculated by dividing the TPRS/ EDTS by the total number of questions (25 in this case). Similarly, the TPRS/EDTS for each of the five dimensions were calculated, and the Dimension Scores (DS) were calculated by dividing these scores by the total number of questions in each dimension (five in this case). Friedman's Two-Way Analysis of Variance by Ranks Test was used to compare the PID-5-CSV scores of each dimension and the Wilcoxon signed-rank test was used if further evaluation of statistically significant results was required. Bonferroni correction was applied when calculating the p value for statistical significance in multiple comparisons. In the analysis of the correlations between the BDI scores and the PID-5-CSV scores, Pearson's correlation coefficient test was used to compare the normally distributed data and Spearman's rank correlation coefficient test was used to compare the non-normally distributed data. Linear regression analysis was used to investigate the effect of the possible confounding factors on the statistically significant correlations. The Kruskal-Wallis test was used to compare the data of the cases divided into categorical groups according to the severity of depression; then, pair-wise analysis was used to further evaluate the results with statistically significant differences. The analysis was performed using IBM Statistics SPSS Version 25.0 for Windows ("IBM SPSS statistics for Windows," 2018).

### 3. Results

The ages of the patients included in our study ranged between 132 months (11 years of age) and 215 months (18 years of age); the ages were not normally distributed (Kolmogorov-Smirnov, p = 0.003) and the median value was 194.5 (IRQ: 36 months). Patients are divided into three age categories which reflect the early, mid and late adolescence time periods (Barrett, 1996). When the patients were examined based on their age ranges, 18 patients (25.7%) were aged between 16–17 years, 21 patients (30%) were between 17–18 years, and 55.7% of the cases (n = 39) were older than 16 years. The distribution of patients according to their age is presented in Figure 1. When the data were examined, the mean TPRS/EDTS was 40.58 ( $\pm$  9.94 SD) from a total of 75, the mean ATS was 1.623 ( $\pm$  0.398 SD) from a

total of three, and the scores were normally distributed (Kolmogorov-Smirnov, p = 0.162). Of the five dimensions of the PID-5-CSV, only the TPRS/EDTS and DS results for Detachment (Kolmogorov-Smirnov, p = 0.056) and Psychotism (Kolmogorov-Smirnov, p = 0.061) were normally distributed (Table 1). Of all of the cases included in the study, the mean/median values were 11 (3 IRQ) for Negative Affectivity, 8.07 (± 3.433 SD) for Detachment, 4 (5 IRQ) for Antagonism, 9 (4 IQR) for Disinhibition, and 7.98 (± 3.031 SD) for Psychotism. When the DS of the PID-5-CSV dimensions were examined, the mean/median values were 2.2 (0.6 IQR) for Negative Affectivity, 1.614  $(\pm 0.687 \text{ SD})$  for Detachment, 0.8 (1 IQR) for Antagonism, 1.8 (0.85 IQR) for Disinhibition, and 1.597 (± 0.606 SD) for Psychotism (Table 1). In the examination of BDI scores as continuous variables, it was seen that the data were normally distributed (Kolmogorov-Smirnov, p = 0.2) and the mean BDI score was 29.63 ( $\pm$  10.26 SD) (Table 1). Of the cases included in the study, 47.14% were severely depressed (n = 33), 42.86% were moderately depressed (n= 30), and 10% were mildly depressed (n = 7) (Figure 2).

**Table 1.** Mean/median values and test of normality characteristics of patients' ages and scale scores

N=70	Mean (SD)ª or Median (In- terquartile Range) <sup>b</sup> Values	p°
Age <sup>d</sup>	194,5 (36) <sup>b</sup>	0,03
PID-5-CSV whole scale;		
TPRS/EDTS	40,58 (± 9,94) <sup>a</sup>	0,162
ATS	1,623 (± 0,398) <sup>a</sup>	
Negative Affectivity;		
TPRS/EDTS	11 (3) <sup>b</sup>	0,038
DS	2,2 (0,6) <sup>b</sup>	
Detachment;		
TPRS/EDTS	8,07 (± 3,433) <sup>a</sup>	0,056
DS	1,614 (± 0,687) <sup>a</sup>	
Antagonism;		
TPRS/EDTS	4 (5) <sup>b</sup>	0,000
DS	0,8 (1) <sup>b</sup>	
Disinhibition;		
TPRS/EDTS	9 (4) <sup>b</sup>	0,001
DS	1,8 (0,85) <sup>b</sup>	
Psychotism;		
TPRS/EDTS	7,98 (± 3,031) <sup>a</sup>	0,061
DS	1,597 (± 0,606) <sup>a</sup>	
BDI Score	29,63 (± 10,26) <sup>a</sup>	0,2

PID-5-CSV, Personality Inventory for DSM-5 Child Form Short Version; BDI, Beck Depression Inventory; TPRS, Total Partial Raw Score; EDTS, Equally Distributed Total Score; ATS, Average Total Score; DS, Dimension Score

<sup>a</sup> Mean values and standart deviations (SD) are given for normally distributed values

<sup>b</sup> Median values and interquartile ranges are given for non-normally distributed values

<sup>c</sup> Kolmogorov-Smirnov test, p values of statistical significance are written in bold

<sup>d</sup> Ages are given in month values



Figure 1. Age distribution of the paticipants



**Figure 2.** Figure 2: Number of patricipants in each depression severity group

When the scores of each of the 25 items of the PID-5-CSV were compared, the 9th question (mean score  $2.54 \pm 0.857$  SD) and the 15th question (mean score  $2.64 \pm 0.826$  SD) received the highest scores. The 12th question (mean score  $0.81 \pm 1.058$  SD), the 17th question (mean score  $0.85 \pm 1.111$  SD), and the 25th question (mean score  $0.71 \pm 1.099$ ) received the lowest scores. A comparison of the scores of the PID-5-CSV dimensions showed a statistically significant difference among them (Friedman's test, p=0.000) (Table 2). In order to determine the dimensions that were accountable for this difference, 10 binary comparisons were conducted and a p value <0.005 was accepted for statistical significance after Bonferroni correction. Consequently, the Negative Affectivity scores of the patients were found to be significantly higher (Wilcoxon test, p = 0.000) while the Antagonism scores were found to be significantly lower (Wilcoxon test, p = 0.000) (Table 3). When the relationship between the PID-5-CSV scores and the severity of depression was investigated, the BDI scores were found to be positively correlated with the whole scale TPRS/EDTS (Pearson's correlation test, p = 0.000), the Detachment dimension's TPRS/EDTS (Pearson's correlation test, p = 0.001), the Disinhibition dimension's TPRS/EDTS (Spearman's correlation test, p = 0.000), and the Psychotism dimension's TPRS/EDTS (Pearson's correlation test, p = 0.000) (Table 4). In the linear regression analysis conducted to determine the effect of age as a confounding factor on the correlations, no statistically significant effect was observed (Table 5).

**Table 2.** Comparison between Total Partial RawScores/Equally Distributed Total Scores of domainsin Personality Inventory for DSM-5 Child Form ShortVersion

N=70	Mean Rank	χ²	df	pª
Negative Affectivity	4,01			
Detachment	3,04			
Antagonism	1,79	76,695	4	0,000
Disinhibition	3,31			
Psychotism	2,85			

<sup>a</sup> Friedman Two-Way Analysis of Variance by Ranks test

**Table 3.** Paired comparisons of Total Partial RawScores/Equally Distributed Total Scores of domainsin Personality Inventory for DSM-5 Child Form ShortVersion

	Negative Affectivity		Detachment		Antagonism		Disinhibition		Psychotism	
	Z <sup>a</sup>	p <sup>a</sup>	Za	p <sup>a</sup>	Za	p <sup>a</sup>	Z <sup>a</sup>	p <sup>a</sup>	Z <sup>a</sup>	p <sup>a</sup>
Negative Affectivity			4,4	0,000	6,265	0,000	3,831	0,000	5,149	0,000
Detachment	-4,4	0,000			4,429	0,000	-1,2	0,23	0,628	0,53
Antagonism	-6,265	0,000	-4,429	0,000			-6,197	0,000	-4,353	0,000
Disinhibition	-3,831	0,000	1,2	0,23	6,197	0,000			2,063	0,039
Psychotism	-5,149	0,000	-0,628	0,53	4,353	0,000	-2,063	0,039		

<sup>a</sup> Wilcoxon Signed Ranks Test, p<0,005 defines statistical significance after Bonferroni correction, p values of statistical significance are written in bold

**Table 4.** Correlation analyses between Beck DepressionInventory scores and Total Partial Raw Scores/EquallyDistributed Total Scores of domains in PersonalityInventory for DSM-5 Child Form Short Version

		р	Correlation Coefficient
BDI Score	PID-5-CSV whole scale Total		
	Partial Raw Score/Equally	<b>0,000</b> ª	0,552
	Distributed Total Score		
	Negative Affectivity	0,085 <sup>b</sup>	0,208
	Detachment	<b>0,001</b> ª	0,397
	Antagonism	0,396 <sup>b</sup>	0,103
	Disinhibition	<b>0,000</b> <sup>b</sup>	0,466
	Psychotism	0,000ª	0,565

PID-5-CSV, Personality Inventory for DSM-5 Child Form Short Version; BDI, Beck Depression Inventory <sup>a</sup> Pearson Correlation Analysis, p values of statistical significance are written in bold

<sup>b</sup> Spearman Correlation Analysis, p values of statistical significance are written in bold

**Table 5.** Regression analysis defining the effect of ageon the statistically significant correlations between BeckDepression Inventory scores and Personality Inventoryfor DSM-5 Child Form Short Version scores

	Correlated PID-5- CSV score	B (95% Cl)	β	R²	pª	
	PID-5-CSV whole scale TPRS/EDTS	0,021 (-0,091 – 0,132)	0,045	0,002	0,714	
on Inventory Score	PID-5-CSV whole scale ATS	0,037	0,001	0,758		
	Detachment TPRS/ EDTS	0,011 (-0,026 - 0,048)	0.072	0.005	0,552	
	Detachment DS	0,002 (-0,005 - 0,010)	0,072	0,003		
seck Depress	Disinhibition TPRS/EDTS	0 105	0.011	0.385		
	Disinhibition DS	0,003 (-0,004 - 0,010)	0,100	0,011	0,000	
	Psychotism TPRS/ EDTS	-0,028 (-0,063 - 0,008)	-0.186	0.034	0.124	
	Psychotism DS	-0,006 (-0,013 - 0,002)	-,	,	0,127	

PID-5-CSV. Personality Inventory for DSM-5 Child Form Short Version; TPRS, Total Partial Raw Score; EDTS, Equally Distributed Total Score; ATS, Average Total Score; DS, Dimension Score <sup>a</sup> Lineer Regression Analysis

The severity of depression was determined by dividing the BDI scores into three groups (mildly depressed group, moderately depressed group, and the severely depressed group) based on the cut-off values; these groups were then compared in terms of the PID-5-CSV scores. Among the three depression severity groups, statistically significant differences were observed in the whole scale TPRS/EDTS (Kruskal-Wallis test, p = 0.000), the Negative Affectivity dimension's TPRS/EDTS (Kruskal-Wallis test, p = 0.04), the Detachment dimension's TPRS/ EDTS (Kruskal-Wallis test, p = 0.017), the Disinhibition dimension's TPRS EDTS (Kruskal -Wallis test, p = 0.008), and the Psychotism dimension's TPRS/EDTS (Kruskal-Wallis test, p = 0.000) (Table 6). Pair-wise analysis was done to determine the depression severity groups that were accountable for this difference. The result showed that the severely depressed patients had higher scores than both the mildly depressed and the moderately depressed patients in each comparison with a statistically significant difference (Table 7).

**Table 6.** Comparisons of item scores and Total Partial Raw Scores/Equally Distributed Total Scores of domains in Personality Inventory for DSM-5 Child Form Short Version between depression severity groups

		χ²	pª
	1	3,066	0,216
	2	2,781	0,249
	3	3,926	0,14
	4	11,598	0,003
	5	2,507	0,286
	6	6,269	0,044
	7	3,132	0,209
	8	1,898	0,387
	9	4,115	0,128
	10	5,102	
	11	0,976	0,614
	12	9,206	0,01
PID-5-CSV item score	13	5,647	0,059
	14	2,859	0,239
	15	0,224	0,894
	16	2,531	0,282
	17	0,963	
	18	2,529	0,282
	19	0,965	0,617
	20	1,176	0,555
	21	10,602	0,005
	22	3,405	0,182
	23	4,138	0,126
	24	11,038	0,004
	25	1,122	0,571
PID-5-CSV whole scale TPRS/EDTS		17,145	0,000
Negative Affectivity T	PRS/EDTS	6,446	0,04
Detachment TPRS/ED	TS	8,183	0,017
Antagonism TPRS/ED	TS	0,368	0,832
Disinhibition TPRS/ED	TS	9,558	0,008
Psychotism TPRS/EDTS		19,965	0.000

*PID-5-CSV, Personality Inventory for DSM-5 Child Form Short Version; TPRS, Total Partial Raw Score; EDTS, Equally Distributed Total Score* 

<sup>a</sup> Kruskal-Wallis Test, p values of statistical significance are written in bold **Table 7.** Pair-wise analysis of statistically significantKruskal-Wallis Test results regarding comparisons of itemscores and Total Partial Raw Scores/Equally DistributedTotal Scores of domains in Personality Inventory forDSM-5 Child Form Short Version between depressionseverity groups

			MildModerateDepressionDepression- Severe- SevereDepressionDepression		Result
		pª	pª	pª	
	4	1,0	0,054	0,007	Severe Depression group scores > Moderate Depression group scores
	6	1.0	0,524	0,048	Severe Depression group scores > Moderate Depression group scores
PID-5-CSV item score	12	0,476	0,02	0,103	Severe Depression group scores > Mild Depression group scores
	21	1,0	0,042	0,018	Severe Depression group scores > Mild and Moderate Depression group scores
	24	0,225	0,006	0,107	Severe Depression group scores > Mild Depression group scores
PID-5-CSV wi scale TPRS/E	hole DTS	1,0	0,006*	0,001	Severe Depression group scores > Mild and Moderate Depression group scores
Negative Affectivity TP EDTS	'RS/	0,743	1,0	0,036	Severe Depression group scores > Moderate Depression group scores
Detachment TPRS/EDTS		0,463	0,029	0,17	Severe Depression group scores > Mild Depression group scores
Disinhibition TPRS/EDTS		1,0	0,044	0,035	Severe Depression group scores > Moderate Depression group scores
Psychotism TPRS/EDTS		0,493	0,001	0,001	Severe Depression group scores > Mild and Moderate Depression group scores

*PID-5-CSV, Personality Inventory for DSM-5 Child Form Short Version; TPRS, Total Partial Raw Score; EDTS, Equally Distributed Total Score* 

## <sup>a</sup> Pair-wise Analysis of Kruskal-Wallis Test, p values of statistical significance are written in bold

When the scores of each question in the three depression groups were examined, a statistically significant difference between the groups was observed in the 4th question (Kruskal-Wallis test, p = 0.003), the 6th question (Kruskal-Wallis test, p = 0.044), the 12th question (Kruskal-Wallis test, p = 0.01), the 21th question (Kruskal-Wallis test, p = 0.005), and the 24th question (Kruskal-Wallis test, p = 0.004). Similarly, the severely depressed patients were found to have significantly higher scores in each question with a statistically significant difference in comparison to both the moderately depressed patients and the mildly depressed patients. No statistically significant difference was observed between the mildly depressed patients and the moderately depressed patients regarding any of the scores or questions (Table 7).

#### 4. Discussion

In our study, the personality traits of MDD patients who were not diagnosed with comorbid psychiatric diagnoses, ranging in age between 11 and18 that had not received any prior psychiatric treatment were evaluated with the PID-5-CSV. Regardless of the patients' PID-5-CSV dimensional scores, the higher whole scale TPRSs/EDTSs results indicate more negative interpersonal relationship features and more pathological personality traits for these patients (Krueger et al., 2011). In this study, we found a positive correlation between the BDI scores and the whole scale TPRSs/EDTS of the MDD patients; moreover, as the severity of depression increased, the whole scale TPRS/EDTS also increased. Consequently, the whole scale TPRS/EDTS was significantly higher for the severely depressed group than the two other groups. In the linear regression analysis, the effects of age as a confounding factor were investigated; it was found that the relationship between the BDI scores and the whole scale TPRSs/EDTSs was independent of age. It is known that for many patients; PDs, especially Borderline PD, coexist with MDD, and the comorbidity rates increase as the severity of depression increases (Guilé et al., 2006; Sharp & Fonagy, 2015). In addition, the severity of PD is a factor that should be evaluated, and it can be used as a guide during psychiatric treatment (Morey et al., 2011). When the findings of our study are evaluated in this context, in accordance with the literature, it can be stated that, as the severity of depression increases, these cases are at risk for developing pathological personality traits and PDs, and a higher whole scale TPRS/EDTS may be an indicator of the general severity of the pathological personality traits. From this perspective, since this is a cross sectional evaluation, it is hard to pinpoint whether PDs occur as a result of depression or PDs comprise a vulnerability to depression; but it can be speculated that depression severity itself creates a sensitivity towards the development and worsening of PDs. Considering that the prognosis is adversely affected in MDD patients with PD comorbidity (Crawford et al., 2008; Gunderson et al., 2014), it is obvious that, in treating these patients, an inclusive treatment approach should be planned that focuses on pathological personality traits as well as depression.

Clinical presentation of MDD is different in children and adolescents than it is in adults. While MDD can manifest as a lack of self-confidence, feelings of guilt, hopelessness, disgust, desire to escape, fear of death, and a high level of anxiety in early adolescence, in adolescence, irritability, impulsivity, behavioral changes, and emotional lability may be symptoms of MDD (Dopheide, 2006; Birmaher et al., 2007; Hopkins et al., 2016). In our study, we found that the Negative Affectivity dimension scores were statistically higher than the other dimensions. The Negative Affectivity dimension consists of anxiousness,

emotional lability, hostility, perseveration, lack of restricted affectivity, separation insecurity, and submissiveness subdimensions (Krueger et al., 2011). The higher scores for anxiety and separation insecurity found in this group may be that reflections of the higher anxiety levels seen in childhood depression (Dopheide, 2006). It was observed that the 9th question ("I can be easily emotional because of small reasons most of the time") and the 15th question ("Almost everything can irritate me very easily") earned the highest scores; these questions measure emotional lability and irritability. Emotional lability and irritability are accepted as the main components of the DSM-IV-TR Cluster-B PDs, especially Borderline PD (Speranza et al., 2012). In parallel with the results of our study, in adolescents with MDD, the severity of Borderline Personality traits increases as the severity of depression increases. In addition to these findings, it should be noted that treatment modalities that focus on these personality traits (especially for Interpersonal Therapy [IPT]) may be useful; moreover, in patients with emotional lability, other pharmacological agents may need to be added to the antidepressant medication (Southammakosane & Schmitz, 2015). Our study found higher aggression scores in these patients; this can be a guide to understanding the direction of behavioral changes seen in childhood depression (Birmaher et al., 2007). Thus, treatment may require the addition of second-generation antipsychotics (Southammakosane & Schmitz, 2015). The efficacy of Cognitive Behavioral Therapy (CBT) and IPT interventions, suggested in the treatment of adolescents with MDD, has also been shown (Hopkins et al., 2016). It should be noted that such treatment choices may be effective in patients with high perseveration scores, which is a sub-dimension of Negative Affectivity (Krueger et al., 2011).

When subjects are examined, in general, although the 12th question ("I can see things that are not real") received the lowest scores, it is important to note that the severely depressed subjects had significantly higher scores on this question than the subjects in the other groups. In previous studies, it was found that psychotic symptoms are more rarely seen in childhood depression than in adulthood depression, and the rate of psychotic symptoms increases as the severity of depression increases in adolescence (Birmaher et al., 2007). In this regard, the findings of our study are consistent with the results reported in the literature, and, for patients with severe depressive episodes, second-generation antipsychotics may be required for treatment of psychotic symptoms in addition to antidepressant medication (Southammakosane & Schmitz, 2015; Mullen, 2018). It has also been shown that the newly developed PID-5-CSV dimensions are appropriate guidelines that can be used to make pharmacotherapy and medication decisions (Klein et al., 2011). Thus, higher Psychotism scores observed in PID-5-CSV may indicate the need for antipsychotic drugs as augmentation drugs or medications to treat psychotic symptoms.

The tendency towards experiencing emotionality and negative affectivity, which is defined as N in the threefactor model proposed by Eysenck & Eysenck, was found to be related to MDD in clinical, epidemiological, familial, and twin studies; it was also defined as a predisposing factor for MDD development in individuals with no previous psychiatric diagnosis (Nyström & Lindegård, 1975; Eysenck & Eysenck, 1985). However, in the same model, E represents sociality, vitality, happiness, and comfort felt with other people (Eysenck & Eysenck, 1985). The association of E with MDD was found to be the exact opposite of N, but E probably has less of an effect than N (Akiskal et al., 1983). Studies that explore the FFM, which is another model in this field, also found that N is a risk factor that plays a large role in the etiology of MDD (Kendler et al., 2004), and it is related to MDD in both clinical- (Roelofs et al., 2008) and population-based samples (Muris et al., 2005). In addition to high levels of N, low levels of Conscientiousness are another predictive factor for MDD (Kotov et al., 2010). Recently, Samuel and Widiger's study investigated the relationship between FFM and DSM-IV-TR PDs. They found that Paranoid PD is positively correlated with N and negatively correlated with Agreeableness, Schizoid PD is negatively correlated with E, Schizotypal PD is positively correlated with N and negatively correlated with E, Antisocial PD is negatively correlated with Agreeableness and Conscientiousness, Borderline PD is positively correlated with N and negatively correlated with Agreeableness and Conscientiousness, Histrionic PD is positively correlated with E, Narcissistic PD is negatively correlated with Agreeableness, Avoidant PD is positively correlated with Agreeableness and negatively correlated with E, Dependent PD is positively correlated with N, and Obsessive-compulsive PD is positively correlated with Conscientiousness (Samuel & Widiger, 2008) (Table 8). However, none of the PDs in the DSM-IV-TR has been found to be correlated with Openness of the FFM (Samuel & Widiger, 2008).

In studies that compared the Dimensional Personality Model of DSM-5 with previous personality models, there is a general consensus that Negative Affectivity in the PID-5-CSV is related to high levels of N in the FFM, Detachment in the PID-5-CSV is related to low levels of E in the FFM, Antagonism in the PID-5-CSV is related to low levels of Agreeableness in the FFM, and Disinhibition in the PID-5-CSV is related to low levels of Conscientiousness in the FFM (Krueger et al., 2011). Apart from these, the relationship between Psychotism in the PID-5-CSV and the Openness in the FFM is controversial (Krueger et al., 2011).

To summarize the findings reported in previous studies, N makes a person more sensitive to the development of depressive symptoms, while conscientiousness is protective personality trait in terms of depression. In this regard, the high Negative Affectivity scores (associated with high N levels in the FFM) and high Disinhibition scores (associated with low Conscientiousness levels in the FFM) we found in our study are consistent with the findings reported in the literature. Studies investigating the relationship between the PID-5-CSV dimensions and psychiatric symptoms have reported that high Negative Affectivity scores are related with anxiety and depression symptoms and high Detachment scores are related with depression symptoms (Few et al., 2013). In a recent research study conducted by Hopwood et al., anxiety disorders were found to be correlated to high Negative Affectivity and Psychotism scores, MDD was found to be correlated with high Detachment, Disinhibition, and Psychotism scores, and suicidality was found to be correlated to high Psychotism scores (Hopwood et al.,

**Table 8.** Table 8: Related Personality Inventory for DSM-5 Child Form Short Version dimensions and DSM-IV-TRPersonality Disorder categories according to Five Factor Model (Krueger et al., 2011; Samuel & Widiger, 2008)

		Related DSM-IV-TR PD Diagnosis Category 41									
FFM Dimension	Related PID-5-CSV Dimension 13	Paranoid PD	Schizoid PD	Schizotypal PD	Antisocial PD	Borderline PD	Histrionic PD	Narcissistic PD	Avoidant PD	Dependent PD	Obsessve- Compulsive PD
Positive Correlation with Neurotism	High Negative Affectivity Scores	• +		• +		• +				• +	
Negative Correlation with Neurotism	Low Negative Affectivity Scores										
Positive Correlation with Extraversion	Low Detachment Scores						•				
Negative Correlation with Extraversion	High Detachment Scores		• +	• +					• +		
Positive Correlation with Agreeableness	Low Antagonism Scores								• +		
Negative Correlation with Agreeableness	High Antagonism Scores	•			•	•		•			
Positive Correlation with Conscientousness	Low Disinhibition Scores										•
Negative Correlation with Conscientousness	High Disinhibition Scores				•	•					

FFM, Five Factor Model; PID-5-CSV. Personality Inventory for DSM-5 Child Form Short Version; PD, Personality Disorder

• Personality Disorder Category related with Five Factor Model dimension (Samuel & Widiger, 2008)

+ Personality Disorder Category related with Personality Inventory for DSM-5 Child Form Short Version dimension (Krueger et al., 2011)

2013). However, most of the studies in this area have been done with adult patients and information about the adolescent age group is limited.

When the results of our study are compared with the literature findings, the most important point is that the Antagonism scores (associated with low Agreeableness levels in the FFM) in the PID-5-CSV were low in our patients, but the Psychotism scores (controversially associated with low Openness levels in the FFM), which are not associated with any of the DSM-IV-TR PDs, were high. We found that, as the severity of depression increased, the Detachment, Disinhibition, and Psychotism scores also increased and the Negative Affectivity, Detachment, Disinhibition, and Psychotism scores were significantly higher in the severely depressed group than the other groups. In the regression analysis, the positive correlation between the severity of depression and the Detachment, Disinhibition, and Psychotism scores appears to be independent of the age of the patients (Table 5).

The high Psychotism scores found in our subjects are in accordance with the results reported by Hopwood et al. (Hopwood et al., 2013); however, the statistically significant low Antagonism scores in comparison to the other dimensions (Friedman's Two-Way Analysis of Variance by Ranks Test p=0.000 and Wilcoxon signedrank test p=0.000) is a finding that, to our knowledge, has never been reported before. This might be due to the fact that our study only included female patients and the age group difference between our study and previous studies. The Antagonism dimension in the PID-5-CSV includes attention seeking, callousness, deceitfulness, grandiosity, and manipulativeness subdimensions (Krueger et al., 2011). Personality traits such as callousness, deceitfulness, and manipulativeness have been reported to be more common in men (Wright & Simms, 2014); so including only female adolescents might be the reason of the low Antagonism scores we observed. Also, considering that the clinical presentation of depression is different in children than it is in adults (Dopheide, 2006; Birmaher et al., 2007; Hopkins et al., 2016), it can be said that the changes in personality traits may be caused by differences in symptomatology. The low Antagonism scores observed in the patients in our study may indicate that adolescents with MDD may be at risk for DSM-IV-TR PDs that were found to be positively correlated with the agreeableness levels in Samuel and Widiger's study (Samuel & Widiger, 2008). They reported that Avoidant PD was the only DSM-IV-TR PD category that was positively correlated with the FFM's Agreeableness dimension. When the relationship between the FFM and the PID-5-CSV dimensions and the findings of our study are evaluated together, the high Negative Affectivity, Detachment, Disinhibition, and Psychotism scores and the low Antagonism scores observed in our cases may indicate a possible risk for adolescent MDD patients to develop Paranoid and Borderline personality traits, and especially Schizoid, Schizotypal, Avoidant, and Dependent personality traits. Related PID-5-CSV dimensions and DSM-IV-TR Personality Disorder categories according to FFM (Samuel & Widiger, 2008; Krueger et al., 2011) is given in Table 8.

In accordance with the literature (Speranza et al., 2012)

and the findings of our study it can be hypothesized that, the high aggression scores (sub-dimension of the negative affectivity dimension in the PID-5-CSV) observed in our adolescent MDD patients may be associated with borderline personality traits; but further studies which evaluated this relationship are needed in this matter. We also found that, in the adolescent age group, the prevalence of psychotic symptoms increases as the severity of depression increases (Birmaher et al., 2007). When we evaluated the severity of depressive symptoms in our study, we found that only 10% of the patients included in the study were in the mildly depressed group, whereas 90% were in the moderately depressed and the severely depressed groups. This uneven distribution may explain the subjects' high risk for paranoid, schizoid, and schizotypal personality traits. Similarly, the association we found between the severity of MDD and the avoidant and dependent personality traits may be helpful in explaining the high prevalence of anxiety symptoms (e.g., separation anxiety) and the high levels of anxiety seen in childhood MDD (Dopheide, 2006). Although previous studies have reported that Borderline PD is the most common comorbid PD seen with MDD (Guilé et al., 2006), the low antagonism levels found in depressive adolescents may suggest that avoidant PD can also be found frequently in this population. However, the symptom heterogeneity in this age group, and the fact that the symptoms are different from those in adulthood, reveal the necessity for further research.

After examining the literature, it can be said that the evaluation of personality traits may be an effective method for determining the individuals at risk for developing depression, selecting the appropriate treatment approach, and predicting the treatment response (Quilty et al., 2008; Klein et al., 2011). Moreover, in studies performed on patients with PDs, the DSM-5 Dimensional Personality Model was found to be better at guiding the choice of treatment modality and the drug to be used than the DSM-IV-TR PD diagnostic categories (Morey & Benson, 2016). When the DSM-5 personality dimensions of adolescents with MDD diagnosis are examined, differences between adolescents and adults can be found, and these differences may be helpful in explaining the symptomatology during adolescence.

The strength of this study is that the cases did not receive prior psychiatric treatment and they did not have any comorbid psychiatric diagnoses that might act as a confounding factor. However, the study has some limitations. The most important limitation is the lack of a control group. Most of the previous studies conducted in this area have been done using a clinical sample, and population-based studies on the dimensional properties of the PID-5-CSV in the adolescent age group are limited. Keeping in mind that personality organizations may be present at a level that does not cause significant deterioration in functionality, it is difficult to say the extent to which the PID-5-CSV profile of the patients that participated in our study will be considered to be pathological or non-pathological. Consequently, there is a clear need for case-control studies that can shed light on this decision. Another limitation of the present study is that it only included female adolescents. It is known

that, along with environmental and genetic factors, the development of personality is affected by gender. In accordance with the differences between genders in the factors that constitute an individual's personality, there are several reasons why the relationship between personality traits and MDD may also differ between genders. First, in previous research, the prevalence of MDD and the average N levels were found to be higher and the average E levels were found to be lower in women (Regier et al., 1988; Tambs et al., 1991). Second, diagnoses, such as Substance Use Disorder and antisocial PD, which have been shown to be related to some of the personality traits such as callousness, deceitfulness, and manipulativeness, are more common in men (Wright & Simms, 2014). Numerous studies have shown that gender-specific genetic factors play a role in both MDD development and N levels, and these affect the relationship between N and MDD (Fanous et al., 2002). Studies conducted in the adolescent age group have reported that levels of positive thinking, adaptation to negative situations, and the need for approval/success are lower and the levels of self-directing negative cognitions are higher in girls than in boys (Calvete & Cardeñoso, 2005). In light of this information, it can be emphasized that there is a need for studies that aim to define gender-specific differences and determine how these differences affect symptomatology in relation to the DSM-5 personality dimensions.

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