

An Examination of the Relationships Between the Psychobiological Model of Personality and Cognitive Theory in Patients Diagnosed With Major Depression and Healthy Individuals



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SUMMARY

Objective: This study aimed to investigate the relationships among temperament-character traits, dysfunctional attitudes, and automatic thoughts as well as to compare the patient group with a diagnosis of Major Depressive Disorder (MDD) and the healthy control group in terms of these variables.

Method: 127 patients with a diagnosis of Major Depressive Disorder and 128 healthy subjects participated voluntarily in the study. The Temperament and Character Inventory (TCI), the Dysfunctional Attitude Scale (DAS), Automatic Thoughts Questionnaire (ATQ), and the Beck Depression Inventory (BDI) were administered to the participants.

Results: It was seen that the patient group had higher harm avoidance as well as lower self-directedness, cooperativeness, and persistence. Moreover, it was seen that the individuals in the patient group had increased frequency of dysfunctional attitudes and automatic thoughts pertaining to depression, when comparing to the control group. In addition, according to the results of the multiple mediating variables analysis, dysfunctional attitudes and automatic thoughts are fully mediated in the relationship between harm avoidance, self-directedness, and depression.

Conclusion: This study shows that cognitive theory and the psychobiological personality model may be used together to explain depression. Accordingly, it can be said that harm avoidance and self-directedness are the risk factors for depression. Based upon the results of this research can be use for preventing depression. Moreover, the effectiveness of cognitive psychotherapy for people who have depression can be augmented by taking these temperament and character traits into consideration.

Key Words: Major depressive disorder, depression, temperament, character, cognitive therapy, cognitive behavioral therapy.

INTRODUCTION

Major Depressive Disorder (MDD), the most common of depressive disorders, is one of the mental disorders that have the greatest impact (Sadock, Sadock 2005, Friedman 2011). Cognitive therapy, one of the most effective psychotherapy methods for depression treatment, has been used for the last fifty years (Beck 2005). Cognitive therapy is based on the cognitive theory, and according to cognitive theory itself, that individuals' thoughts shape their behavior by influencing their mood either directly or indirectly (Beck 1991, 2001). Depression is derived from individual's cognitive

misinterpretation, negative distortions, negative self-evaluation, and hopelessness. People have strict negative beliefs directed to the self, future, and outer world that start to settle in during childhood (this issue is referred to as the "cognitive triad"). These negative beliefs gradually develop and result in negative thoughts, attitudes, and judgments. Thus, these thoughts directly or indirectly impact the mood of person (Beck et al. 1979).

Studies have demonstrated that participants diagnosed with depression have a greater frequency of negative thoughts than participants without a diagnosis. Research conducted with

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the Dysfunctional Attitudes Scale and Automatic Thought Questionnaire, which is known to evaluate negative depressive cognitions, provided the data showing that the means of depressive participants for these scales are greater than the means of the control group (Eaves, Rush 1984, Chioqueta, Stiles 2004, Wang et al. 2010, Nishikawa, Matsunaga, Furutani 2013). These findings supported the hypothesis that negative thoughts and beliefs cause depression, which is also asserted by cognitive theory.

One other variable that is considered to cause depression is personality traits. The relationship between depression and personality traits has been investigated several times by studies using Cloninger's (1987) temperament and character dimensions. In literature, there are many studies that demonstrate a high correlation between depressive mood state, harm avoidance, and self-directedness dimensions (Peirson, Heuchert 2001, Richter et al. 2003, Nery et al. 2009, Arkar 2010, Takahashi et al. 2013).

The main purpose of the study is to investigate the relationship between Cloninger's seven factors psychobiological personality model and Beck's cognitive model for depression. The relationships between personality traits and negative beliefs/thoughts were examined in the patient group with Major Depressive Disorder and the healthy control group. Whether temperament and character traits, dysfunctional attitudes and automatic thoughts differentiate in terms of depression diagnosis; how temperament and character traits affect dysfunctional attitudes and automatic thoughts; and whether cognitions have a mediator role in the relationship between personality and depressive mood were investigated.

METHOD

Participants

The sample of the study consisted of 127 patients suffering from Major Depressive Disorder, receiving medical treatment in Ege University Hospital Mental Health and Disease Clinic, and 128 healthy participants without any mental disorder. All subjects participated voluntarily. The control group was composed after the patients group was formed so that the participants in the control group could match the patient group with regard to several demographic characteristics. Therefore, the control group was collected with half purposive sampling according to accessibility principles.

Patients were diagnosed according to the DSM-IV by experienced psychiatrists carrying out their treatment. Excluded criteria are as follows: For the patient group: 1) With psychotic disorder, 2) With cognitive disorder, 3) With bipolar disorder, 4) With mental retardation, 5) Cognitive capacity preventing the filling in of scales; For the control group: 1) Received

professional help for mental health, 2) Used psychiatric drugs, 3) Cognitive capacity preventing the filling in of scales.

The patient group and control group were similar in terms of various demographic variables. There was no significant difference between groups regarding age, $t(253) = 0.63$, $p > .05$; gender Pearson $\chi^2(1, N = 255) = 0.01$, $p > .05$ and marital status Pearson $\chi^2(1, N = 255) = 5.51$, $p > .05$.

All participants in the patient group continued their medical treatment during data collection. The first appeal year of 37 participants in this group was 2013. 63 participants received regular psychiatric treatment for less than a year; 31 participants 1 to 3 years; 9 participants 3 to 5 years; and 24 participants more than 5 years. Also, 17 participants in the patient group were hospitalized due to mental problem. In addition, the mean of the Beck Depression Inventory was 25.05, while the standard deviation was 12.09.

Instruments

Socio-demographic Data Form: This form has been prepared by researchers in order to determine the participants' various features. The form, including questions about general information such as age, gender, education level, and occupation, was used to match up the sample.

Temperament and Character Inventory: TCI. This inventory has been developed to evaluate 4 temperaments (novelty seeking, harm avoidance, reward dependence, and persistence) and 3 character dimensions (Self-directedness, cooperativeness, and self-transcendence) which are based on Cloninger's psychobiological model pioneered by Cloninger in 1986-87. Psychometric studies by Köse and colleagues (2004) as well as Arkar and colleagues (2005) displayed that TCI is valid in Turkey. There are 240 true/false items in TCI. It is a self-report scale and applicable to individuals above 17 years of age.

Dysfunctional Attitudes Scale: DAS. This scale has been prepared to measure characteristic cognition in depression by Weissman and Beck in 1978. This scale, which is based on cognitive theory, aims to evaluate intermediate beliefs occurring with depressive mood. Individuals' conjectures related to self, others, and the world are measured with items that consist of these beliefs causing vulnerability to depression. The scale has been adopted into Turkish by Şahin and Şahin (1992a). DAS, which is prepared as 7-point Likert scale, is a self-report. The lowest score of the scale is 40, while the highest is 280. The highest score from scale shows excess of dysfunctional attitudes (intermediate beliefs).

Automatic Thoughts Questionnaire: ATQ. ATQ, which was developed by Hollon and Kendall in 1980, has been prepared to examine automatic thoughts related to depression and how often these thoughts come to mind. The scale was translated into Turkish by Şahin and Şahin (1992b), and also

has confirmed reliability and validity. ATQ contains 30 items on a 5-point Likert scale. The lowest score of ATQ is 30, the highest score is 150. The high score means an excess of the individual's automatic thoughts.

Beck Depression Inventory: BDI. The scale, which assesses 21 depressive symptoms and their severity, was developed by Beck in 1961. It has been adapted into Turkish by Tegin (1980) and Hisli (1989). BDI consists of 21 items and is self-report inventory, and there are 4 options in each item. The lowest score of the inventory is 0, while the highest score is 63. As the score increases, the severity of depression rises.

Procedure

Before starting the data collection, ethical committee permission was obtained by the Ege University Medical School Clinical Research Ethical Committee. Firstly, data was collected from the patient group, then data was collected from the healthy control group. The control group was similar to the patient group during the administration, which is held between October 2013 and May 2014. Initially the demographic form was given to the participants, then after signing the informed consent form the other 4 scales were given in varying orders by using the complete opposite balance method in order to eliminate the order effect. Participants completed instruments in approximately 45 minutes.

Finally, the data was analyzed using SPSS (Statistical Package for the Social Sciences) 17. In this study, multivariate analyses of variance (MANOVA), Pearson correlation analysis, and hierarchical regression analysis was applied for data analysis.

RESULTS

In order to understand the differences of temperament and character traits of the patient and control groups, two multivariate analyses of variance (MANOVAs) were separately conducted with personality domains and cognitions. According to the result of the analyses, the diagnosis of Major Depressive Disorder had a significant main effect on temperament and character domains, Multivariate $F(7, 247) = 23.46$, $p < .001$, Wilks' Lambda = 0.60, $\eta^2 = .40$. Similarly, it was observed that the diagnosis of Major Depressive Disorder had a significant main effect on dysfunctional attitudes and automatic thoughts, Multivariate $F(2, 252) = 96.10$, $p < .001$, Pillai's Trace = 0.57, $\eta^2 = .43$.

Results of the one way analysis of variance (ANOVA) of each dependent variable and means of scales are presented in Table 1. Alpha levels were taken with Bonferroni correction 0.007 and 0.025, respectively, in order to absorb a type 1 error, and while differences between groups were detected, the levels were still used.

Table 1. Means and standard deviations of patients and control groups

	Patient Group X (SD)	Control Group X (SD)	F	η^2
Novelty Seeking	18.23 (5.19)	17.49 (4.64)	1.42	.01
Harm Avoidance	23.91 (5.97)	15.52 (6.27)	119.77*	.32
Reward Dependence	13.96 (3.56)	14.54 (3.17)	1.88	.01
Persistence	4.51 (1.63)	5.21 (1.76)	10.84*	.04
Self-Directedness	22.63 (7.29)	30.24 (4.95)	95.38*	.27
Cooperativeness	26.87 (6.64)	31.51 (5.40)	37.52*	.13
Self-Transcendence	18.83 (5.83)	20.23 (5.94)	3.60	.01
Dysfunctional Attitudes Scale	158.15 (40.75)	125.90 (31.24)	50.43**	.17
Automatic Thoughts Questionnaire	87.78 (31.80)	45.73 (12.65)	192.95**	.43

* $p < .006$ ** $p < .025$

Thus, individuals' scores of the subscale of TCI have differed according to diagnosis of depression. Harm avoidance score of people with MDD is greater than that of the control group; also persistence, self-directedness, and cooperativeness scores are less.

In addition, it was considered that individuals' cognitions have differed with regard to depression. Means of the DAS and ATQ of people in the patient group are significantly greater than the healthy control group. People with MDD have more negative thoughts than people with any mental disorder.

The relationships among participants' temperament and character traits, cognitions (dysfunctional attitudes and automatic thoughts) and depressive mood were investigated with Pearson correlation coefficients. Results are presented in Table 2. According to the results, in general, harm avoidance and self-directedness subscales were related to other scales in both patient and control groups. It was seen that the harm avoidance temperament trait increased as dysfunctional attitudes, automatic thoughts, and depressive mood state increased.

Table 2. Pearson correlation coefficients among scales in patient and control groups

		DAS		ATQ		BDI	
		Patient	Control	Patient	Control	Patient	Control
TCI	NS	-.13	.13	.06	.03	.00	-.08
	HA	.35**	.19*	.50**	.28**	.50**	.25**
	RD	-.14	.11	-.12	.04	-.14	-.07
	P	-.10	-.10	-.09	-.03	.04	.05
	SD	-.50**	-.28**	-.66**	-.38**	-.58**	-.40**
	C	-.26**	-.25**	-.29*	-.12	-.28*	-.29**
	ST	.19*	.16	.22*	.16	.17	.18*

* $p < .05$ ** $p < .01$ TCI: Temperament and Character Inventory; NS: Novelty Seeking; HA: Harm Avoidance; RD: Reward Dependence; P: Persistence; SD: Self-Directedness; C: Cooperativeness; ST: Self-Transcendence; DAS: Dysfunctional Attitudes Scale; ATQ: Automatic Thoughts Questionnaire; BDI: Beck Depression Inventory.

However, self-directedness increased while these negative cognitions and depressive mood decreased. Furthermore, cooperativeness and self-transcendence, which are other character dimensions, correlated significantly with dysfunctional attitudes, automatic thoughts, and Beck depression inventory particularly in the patient group. In general, correlation coefficients in the patient group were more than those in the control group.

A three-stage hierarchical linear regression analysis was used to predict the level of depression in the patient group. Temperament and character domains, dysfunctional attitudes score, and automatic thoughts score were used as predictor variables.

Seven dimensions of TCI, novelty seeking (NS), harm avoidance (HA), reward dependence (RD), persistence (P), self-directedness (SD), cooperativeness (C), and self-transcendence (ST), were entered in order to predict depression score in the first block. In the next block, the DAS total score was entered; finally, the ATQ score was entered in the last block. Results of the hierarchical regression analysis are shown in Table 3.

According to first step, temperament and character dimensions significantly predicted depression score, $R^2 = .44$, $F(7, 119) = 13.12$, $p < .01$. In this model, two personality dimensions were found to be significant. Individuals' depression was positively predicted by the harm avoidance temperament dimension and negatively by the self-directedness character dimension.

The second step, in which DAS, evaluating dysfunctional attitudes, was added significantly predicted depression level, $R^2 = .50$, $F(8, 118) = 14.58$, $p < .01$. According to this result, besides HA and SD, individuals' intermediate beliefs were successful in predicting depression. Dysfunctional attitudes explained 6% variance in depression after controlling for HA and SD in the first step.

In the final step, the total ATQ score was entered to explain the depression score. Depression level was significantly predicted

by ATQ, $R^2 = .70$, $F(9, 117) = 26.85$, $p < .01$. In this step, it was seen that with the entry of automatic thoughts, a significant level of harm avoidance was decreased and a significant level of self-directedness and dysfunctional attitudes disappeared. Thus, automatic thoughts explained 10% variance of depression after controlling variables in other steps.

Two other mediation analyses based on hierarchical regression analysis were used. In the analyses, the independent variables were harm avoidance and self-directedness, the dependent variable was depression score, and the mediating variables were DAS and ATQ total scores.

Whether dysfunctional attitudes and automatic thoughts had mediator effects on the relationship between harm avoidance and depressive mood was examined by multiple mediation analysis. As Figure 1 illustrates, harm avoidance had a direct effect on depression score ($\beta = 1.01$, $t = 6.41$, $p < .01$). Furthermore, it had significant effects on both dysfunctional attitudes ($\beta = 2.36$, $t = 4.12$, $p < .01$) and automatic thoughts ($\beta = 2.64$, $t = 6.38$, $p < .01$). It was seen that DAS was not significant ($\beta = 0.03$, $t = 1.46$, $p > .05$), however ATQ was found to be significant ($\beta = 0.27$, $t = 10.55$, $p < .01$) when considering the impact of mediator variables on depression score. When harm avoidance and mediator variables were entered into the model, the relationship between harm avoidance and depression decreased ($\beta = 0.23$, $t = 1.96$, $p > .05$). Therefore, it can be said that dysfunctional attitudes and automatic thoughts have a full mediating effect on this relationship. The significance of this effect was investigated using 1000 bootstrap sampling, as recommended by Preacher, Hayes (2008). Thus, the indirect effect of the two mediator variables, namely cognition, was statistically significant (point estimate = .77, 95% BCa CI [.55 - 1.02]). Notwithstanding, the specific indirect effect of dysfunctional attitudes was not significant (point estimate = .06, 95% BCa CI [-.04 - .18]), and the indirect effect of automatic thoughts was significant (point estimate = .71, 95% BCa CI [.50 - .93]).

Table 3. Results of hierarchical regression analysis for Beck Depression Inventory

		NS	HA	RD	P	SD	C	ST	DAS	ATQ	Constant	R ²	F	F for ΔR^2
Step	B	.06	.72	-.33	.90	-.62	-.11	.22			19.98	.44	13.12**	13.12**
1	SE B	.18	.17	.28	.56	.16	.17	.15						
	β	.03	.36**	-.10	.12	-.37**	-.06	.11						
Step	B	.20	.64	-.23	1.01	-.42	-.09	.12	.09		0.15	.50	14.58**	14.41**
2	SE B	.17	.16	.27	.53	.16	.16	.15	.02					
	β	.09	.32**	-.07	.13	-.25**	-.05	.06	.30**					
Step	B	.02	.28	-.14	.53	-.02	-.07	.01	.03	.26	-7.04	.70	29.85**	76.96**
3	SE B	.14	.13	.21	.42	.13	.13	.11	.02	.03				
	β	.01	.14*	-.04	.07	-.01	-.04	.01	.08	.68**				

* $p < .05$ ** $p < .01$ NS: Novelty Seeking; HA: Harm Avoidance; RD: Reward Dependence; P: Persistence; SD: Self-Directedness; C: Cooperativeness; ST: Self-Transcendence; DAS: Dysfunctional Attitudes Scale; ATQ: Automatic Thoughts Questionnaire.

DISCUSSION

The purpose of this study is to examine the relationship between the psychobiological personality model and cognitive theory as well as how temperament and character features affect negative beliefs and predict depression over those beliefs. In accordance with this purpose, cognitions, temperament, and character traits were examined in Major Depressive Disorder patients in the patient group as well as the control group for comparison. Thus, temperament and character features as well as dysfunctional attitudes and automatic thoughts of both patient and control groups were compared. Also the relationships between the aforementioned variables were examined.

The first research question of this study was about whether individuals' cognition and personality traits differ according to depression diagnosis. It was found that the four dimensions of temperament and character differed between depression patients and healthy people. Moreover, the results showed that people with MDD were characterized with more harm avoidance and less persistence, self-directedness, and cooperativeness. In literature, there are many studies showing that these dimensions (especially harm avoidance and self-directedness) differ according to whether there is a diagnosis of depression (Marijnissen et al. 2002, Smith et al. 2005, Jylha, Isometsa 2006, Nery et al. 2009, Bahçeci et al. 2010, Takahashi et al. 2013, Bensaeed et al. 2014). In the aforementioned studies, there were no findings regarding a difference in the persistence dimension. However, considering that individuals who score low on the persistence dimension are characterized with laziness, giving up easily, contenting themselves and not wanting more, and being broken easily facing criticism; it is advisable that this dimension is related to depression. On the other hand, if it is known that people characterized with high harm avoidance, self-directedness, and low cooperativeness are anxious, tense, pessimistic, hopeless, intolerant, have low self-esteem and interest in others, and also have problems with internal organization (Arkar et al. 2005). It is possible that those people display depressive symptoms as a result of hopelessness, tension, low self-esteem, and isolation from social circle which is also seen in depression (American Psychiatry Association 1994).

In this study, it is found that healthy individuals have less dysfunctional attitudes and automatic thoughts related to depression when compared to depression patients as expected. Accordingly, it can be said that people are in depression because of the excessiveness of their negative cognition. Although deriving a causal relationship with the analysis used in this study is difficult, the findings can be supported by Beck's theory (1964, 1991, 2001). Besides, other studies showing that MDD patients have greater dysfunctional attitudes and automatic thoughts in literature (Eaves, Rush

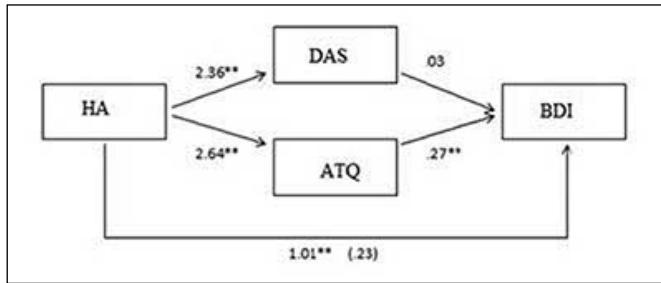


Figure 1. A multiple mediation model of the relationship between harm avoidance and Beck depression score as mediated by dysfunctional attitudes and automatic thoughts. Unstandardized beta is presented in figure. ** $p < .01$.

Additionally, whether dysfunctional attitudes and automatic thoughts had any mediation effect on the relationship between self-directedness and depressive mood was examined by multiple mediation analysis. The result is presented in Figure 1. According to the results, it was considered that self-directedness had a direct negative effect on the depression score ($\beta = -.96$, $t = -7.92$, $p < .01$). Moreover, it had significant effects on both dysfunctional ($\beta = -2.80$, $t = -6.48$, $p < .01$) and automatic thoughts ($\beta = -2.87$, $t = -9.76$, $p < .01$). Also, it was seen that DAS did not have a significant effect ($\beta = .03$, $t = 1.43$, $p > .05$), however, the effect of ATQ was significant ($\beta = 0.28$, $t = 9.96$, $p < .01$). When self-directedness and mediator variables were entered into the equation simultaneously, the prediction power of self-directedness declined and was not significant ($\beta = -.08$, $t = -.72$, $p > .05$). Thus, it can be said that dysfunctional attitudes and automatic thoughts have a full mediating effect on the relationship between self-directedness and depression. Significance of this effect was investigated using 1000 bootstrap sampling, as recommended by Preacher, Hayes (2008). According to the analysis, the indirect effect of the two mediator variables was statistically significant (point estimate = $-.88$, %95 BCa CI $[-1.14 - -.68]$). Although, the specific indirect effect of dysfunctional attitudes was not significant (point estimate = $-.08$, %95 BCa CI $[-.22 - .02]$), the indirect effect of automatic thoughts was found to be significant (point estimate = $-.80$, %95 BCa CI $[-1.02 - -.60]$).

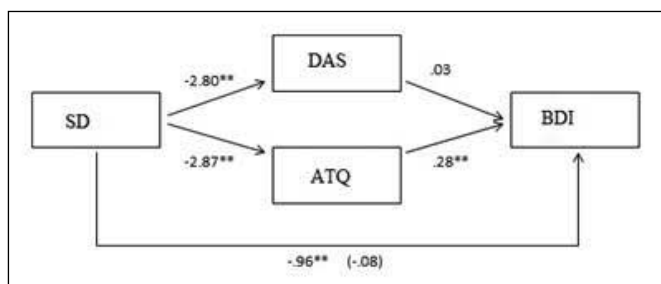


Figure 2. A multiple mediation model of the relationship between self-directedness and Beck depression score as mediated by dysfunctional attitudes and automatic thoughts. Unstandardized beta is presented in figure. ** $p < .01$.

1984, Aytar 1987, Beevers et al. 2003, Chioqueta, Stiles 2004, Wang et al. 2010, Sankar et al. 2014) show similarity with the findings of this research. At this stage, as Beck and his colleagues (1979) said, a person's negative perceptions of himself, others, and the world (cognitive triad) can lead to depression. It can be said that people, who experience the aforementioned cognitions, are prone to depression since both DAS and ATQ aim to measure the same perceptions.

The other research question of this study was about whether there are relationships between automatic thoughts, dysfunctional attitudes, temperament, and character. In this regard, correlation analysis was conducted and it was found that there are significant relationships between people's thoughts, beliefs, temperament, and character traits in general. It is inferred that particularly both the highness of harm avoidance and lowness of self-directedness are in relation to cognitions causing depression.

In this study, a positive correlation was found between dysfunctional attitudes and harm avoidance as well as a negative correlation between self-directedness and cooperativeness in both patient and control groups. Those findings display a similarity between other studies. Luty and her colleagues (1999) conducted a study with depression patients and found that harm avoidance, self-directedness, and cooperativeness personality traits are in relation to dysfunctional attitudes. They also reported that persistence relates to the total score of DAS in addition to those dimensions; however, in our study there were no findings similar to this. In literature, although there are a small number of studies related to this topic, they have found similar results (Richter, Eisemann 2002, Çelik 2007).

Considering that temperament is inborn and in response, character is shaped by socio-cultural learning (Cloninger et al. 1993), the highness of harm avoidance can lead to the development of negative beliefs associated with depression. On the other hand, the cognitive triad used in explaining depression in the cognitive model can be supported by character dimensions. A person's negative perceptions and beliefs about himself, environment, and world can be related to character traits besides both character dimensions' and cognitive triad's development stages that are the same. This is because that self-directedness shows the characteristics about oneself, cooperativeness shows characteristics about others, and self-transcendence shows the characteristics about the universe (Cloninger et al. 1993). The highness of dysfunctional attitude of people who score low on both self-directedness and cooperativeness shows that there is a strong link between character dimensions and thoughts.

Another finding obtained from this study is that there are relationships between automatic thoughts, temperament, and character traits which are peculiar to depression. In the control group, there is a moderate correlation between these two variables, while there is high correlation between them in

the experimental group. The automatic thoughts of healthy people positively correlated with harm avoidance, and negatively correlated with self-directedness. The same pattern for these two personality traits is seen in the patient group; however, there are more significant relationships between automatic thoughts and personality traits. In this group, low self-directedness, cooperativeness, high harm avoidance, and self-transcendence are closely related to negative automatic thoughts. Particularly, the association between three character dimensions and automatic thoughts in depressed individuals support the link between character traits and the cognitive triad mentioned above.

In literature there is no study investigating the psychobiological model of personality and automatic thoughts; however, there is Kopala-Sibley and Santa (2009)'s study conducted with another personality model. In this study, they found a positive correlation between the over self-criticism personality trait, which is evaluated as risk factor for depression and automatic thoughts. According to this, it can be said that personality traits are associated with automatic thoughts.

Another important finding of this study is related to the results of the hierarchical regression analysis. To demonstrate the mood of depression patients, all variables were analyzed incrementally. These individuals' personality traits and cognitions accounted for 70% of the variance of depression in the last step.

Hierarchical regression analysis was founded on a theoretical basis, and predictor variables were analyzed by considering the development rank. According to Cloninger (1987), temperament is inherited and when people are born, while character develops in the early years of life. Because of this reason, temperament and character dimensions were analyzed first. Then, schemas/intermediate belief and dysfunctional attitudes, which were said to have developed in childhood by Beck (1964, 1991, 2001), were added to the analysis and at the third level automatic thoughts, which affect mood directly, were included in the analysis.

Both harm avoidance and self-directedness personality traits were significant in explaining depressive mood (44%). This percentage is similar to the findings of Cloninger and his colleagues' (2006) longitudinal study. In addition, similar findings can be seen in Naito and colleagues' (2000) and Farmer and Seeley's (2009) studies. In turn, it can be said that the high level of harm avoidance and the low level of self-directedness are main risk factors for depressive mood. The same personality dimensions and attitudes explain half of the depressive mood in the second phase of regression analysis when dysfunctional attitudes were included in the analysis. It was shown that the explanatory effect of personality traits on variance slightly decline when cognitions manifest. The automatic thoughts included in the final step remove the contribution of self-directedness and dysfunctional attitudes to the model

and also decrease the contribution of harm avoidance; this successfully explains the variance of depression. This finding shows that those temperament and character traits which were effective in explaining depression lose their effect when negative cognitions/thoughts manifest.

From this point of view, the multiple mediation analysis was performed, in which these two aforementioned personality traits were used as independent variables. The depression score was used as the dependent variable and dysfunctional attitudes and automatic thoughts were used as the mediator. The results showed that both harm avoidance and self-directedness explain depression over dysfunctional attitudes and automatic thoughts as expected. Although these two personality traits explain depression successfully, they lost their significance when cognition manifested. That is, dysfunctional attitudes and automatic thoughts have the mediator role in the relationship between harm avoidance, self-directedness, and depressive mood. Two personality traits explain depression over cognition. Gaweda and Kokoszka's (2014) study showing that metacognitive beliefs possess the mediator role in the relationship between harm avoidance and depressive symptoms support our findings. In the study conducted with another personality measures, it is found that non-adaptive schemas possess the mediator role in the relationship between personality traits and depression (Petrocelli et al. 2001). Therefore, it can be said that personality traits affect thoughts and lead to depression over them. This finding emphasizes the role of cognitive behavioral therapy in the treatment of depression.

In conclusion, this study demonstrates that cognitive theory and the psychobiological personality model can be taken together to explain depression. Personality emphasizes the importance of the development of character regarding depression in particular. One can infer that the character traits related to the acceptance and the ability of managing ourselves can affect our cognitions. This study is important since it shows that our personality traits affect a large part of our life and should be taken into account in understanding individuals and creating solutions. Since this study was designed with a clinic sample in a controlled manner, the results can be compared and generalized. In addition to all these things, this information can be used in clinical applications and can contribute to future studies and psychotherapy works.

Realizing the relationship between temperament, character traits, and cognitions seen in depression is extremely important in preventing depression studies. Analyzing personality traits of individuals before any mental problem occur has much merit in studies striving to prevent possible illness.

On the other hand, it is thought that the findings of this study can shed light on the psychotherapy of depressed individuals. The importance of personality traits on treatments

stands out recently (Zinbarg et al. 2008). Changing one's personality is not the purpose. But rather, the purpose of using personality in therapies is intervening to symptoms related to personality and correctly choosing the therapeutic techniques based on the individual. Within this context, studying the negative symptoms seen in high harm avoidance and low self-directedness can cause changes in people's depressive moods according to the findings obtained from this study. Considering that temperament traits don't change, giving weight to character traits on this point can lead to better results. Luty and her colleagues (1999) reported that therapists should use the self-directedness character dimension with the same approach. One should give weight to this character dimension especially when using interpersonal psychotherapy and cognitive psychotherapy. Also, based on the results of mediator variable analysis, it can be said that the thoughts that affect personality should certainly be used. It is thought that working with thoughts, without focusing on personality can change people's depressive mood, especially in short term psychotherapy works.

In conclusion, this study is a precursor study taking the psychobiological personality model and cognitive model from this point of view. Having not come by another study which investigates temperament, character traits, intermediate belief, and automatic thoughts together supports the idea mentioned above. However, further quantitative and qualitative studies on this topic will fill the gap in this field. If future studies are designed with consideration of the limitations of this study, they can significantly contribute to literature.

This study was conducted with Major Depressive Disorder patients with the thought that the relationship between personality and thoughts could be clearly seen. However, one of the limitations of this study is that it cannot control for a comorbid diagnosis of the patient group. The participants of this study were diagnosed with Major Depressive Disorder by a physician; nevertheless, there can be patients who have comorbid diagnosis (outside the exclusion criteria) in the study. This situation could not be controlled for because of the construction of the clinic in where participants were obtained. For instance, anxiety disorder frequently showing comorbidity with depression cannot be controlled which may affect people's answers. Therefore, the results should be carefully interpreted and further studies should be carried out with both diagnostic scales and patients with one diagnosis. Furthermore, the relationship between variables and other disorders should be examined.

Additionally, the same studies should be conducted using measurements based on other personality theories such as the Five Factor personality model (Big Five) in order to understand the relationship between personality and cognition. Also, in further studies long term longitudinal design should be used.

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