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ORIGINAL ARTICLE

# Associations of dysfunctional attitudes, ruminations and metacognitive beliefs about rumination with pharmacological treatment response in patients with first episode of major depression

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## ABSTRACT

**Introduction:** The aim of this study is to investigate whether treatment with selective serotonin reuptake inhibitors (SSRI) has an effect on the ruminative response, ruminative beliefs and dysfunctional attitudes (DA), and to evaluate the effects of pre-treatment dysfunctional attitudes and rumination levels on treatment response in individuals diagnosed with the first episode of major depression (MD).

**Methods:** 110 patients with MD participated in this study. Participants were evaluated with the Hamilton Depression Rating Scale (HDRS), the Clinical Global Impression Scale (CGI), the Short Version of Ruminative Response Scale (RRS), the Positive Beliefs about Rumination Scale (PBRS), the Negative Beliefs about Rumination Scale (NBRS), and the Dysfunctional Attitude Scale form A (DAS-A) before receiving SSRI treatment and 2 months after the onset of treatment.

**Results:** After two months of SSRI treatment, patients were divided into two groups, remission and non-remission groups. The decrease in RRS subscales and total scores, NBRS uncontrollability and danger of ruminations score, PBRS total score and DAS-A autonomous attitude scores were significantly higher in the remission group. RRS and DAS-A scores were found to be predictors of remission.

**Conclusions:** DA and ruminations may be associated with poor response to SSRI treatment in depression.

## KEY POINTS

- After treatment with selective serotonin reuptake inhibitors, ruminations, dysfunctional attitudes, and positive and negative metacognitions on ruminations significantly decreased in patients with a first episode of major depression.
- The decrease in ruminations, autonomous attitudes, the metacognitions on the uncontrollability and danger of ruminations, and positive metacognitions on ruminations was higher in remission group compared to the non-remission group.
- Ruminations and dysfunctional attitudes significantly predicted remission in first episode of major depression.

## Introduction

Dysfunctional attitudes (DA) and ruminations are cognitive attributes that are risk factors for the development, maintenance and relapse of depression (Beck et al., 1979; Papageorgiou & Wells, 2003; Treynor et al., 2003). DA is defined as over-generalized, strict and inappropriate rules that drive one's life and are difficult to change with new experiences gained through life (Beck et al., 1979; Kuiper et al., 1989). Studies on DA were generally conducted in patients with recurrent depression and in samples grouped by the level of DA scores. While some studies suggested that patients with depression with high DA levels respond better to drugs and psychotherapy (Miller et al., 1990; Pedrelli et al., 2008; Shankman et al., 2013), it has also been stated that DA does not change the response to depression treatment (Bockting et al., 2006).

Rumination has various definitions according to different theories, and it is accepted as a mental activity that does not have a consensus conceptual definition, yet (Smith & Alloy, 2009). According to the response style theory, rumination is described as repetitive thoughts that focus on the meaning, possible causes and the consequences of depressive symptoms. Ruminative processes focus an individual's attention on negative emotions and make negative thoughts more prominent (Nolen-Hoeksema et al., 1999). It has been stated that there are two different ruminative processes associated with depression: reflective pondering and brooding (Treynor et al., 2003). Brooding is more associated with pessimistic thinking whereas reflective pondering as a functional process is much more constructive and effective in problem-solving. Previous findings suggested that brooding is more associated with current and future depression, while reflective pondering is only associated with current depression.

In a study comparing the effects of the problem-solving therapy with treatment with a selective serotonin reuptake inhibitor (SSRI), paroxetine and placebo on ruminations, the results showed that the therapy and drug treatment were effective in reducing ruminations; however, they did not have superiority over each other (Schmaling et al., 2002). Another 28-week follow-up study designed to compare the effects of SSRI and SSRI plus cognitive-behavioral therapy (CBT) on ruminations showed that reflective

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pondering and brooding decreased in both groups while there was a greater decrease in the CBT group, especially in brooding (Wilkinson & Goodyer, 2008).

One's own beliefs about his/her thoughts are defined as "metacognitive knowledge" and the thinking processes such as trying to control the thoughts are called "metacognitive regulation strategies." According to the self-regulatory executive function (S-REF) model that forms the basis of the metacognitive theory, an individual reacts to his/her thoughts through the metacognitive knowledge and the metacognitive regulation strategies and engages in coping strategies for these thoughts (Wells & Matthews, 1994). There are two types of metacognitions that play a role in this process. Positive metacognitions include the belief that ruminations and dysfunctional coping strategies are useful. Besides, negative metacognitions emerge following the positive metacognitions and include the beliefs that the processes triggered by positive metacognitions (e.g., ruminative thoughts) may have harmful effects due to their uncontrollability, or concerning their negative social or interpersonal consequences. For every disorder, there are underlying metacognitions specific to that disorder. According to the metacognitive model of depression, positive beliefs about ruminations increase the tendency to ruminate as a reaction to depressive mood, while long-lasting ruminations trigger the negative metacognitive beliefs about the uncontrollability, danger or negative interpersonal or social effects of these ruminations (Papageorgiou & Wells, 2003; Wells, 2009).

In STAR*D (Sequenced Treatment Alternatives to Relieve Depression) study, with its naturalistic design as one of the most important depression studies to date, only one-third of the cases fully remitted with the first-choice treatment application in the treatment of depression (Rush, 2007). It was also found that only 13% of the patients who did not respond well to initial antidepressant treatment could have full remission with the fourth drug treatment (Rush et al., 2006). In current treatment approaches, apart from pharmacological and biological treatment options, psychotherapy, especially CBT should be added to antidepressant treatment at all stages of depression treatment. This combination would increase the treatment response and remission rates in depression (Ijaz et al., 2018).

CBT, interpersonal psychotherapy (IPT-A), metacognitive therapy (MCT) and mindfulness-based stress reduction (MBRS) are known as effective conventional and up-to-date treatment modalities for cognitive attributes of DA and ruminations (Cristea et al., 2015; Ramel et al., 2004; Wells et al., 2009; Wilkinson & Goodyer, 2008; Zhou et al. 2021). However, studies on the effects of antidepressant treatment on DA and ruminations are limited with inconsistent results. Before applying SSRIs as a first-line treatment option to patients diagnosed with MD for the first time, detection of which DAs and ruminations are associated with poor response and which DAs and ruminations persist despite SSRI treatment can provide effective treatment with no need for multiple drug use. We hypothesised that high scores of pre-treatment DAs and ruminations are associated with poor response to SSRIs in patients with MD diagnosed for the first time; SSRI treatment significantly decreases DA and ruminations; and there is a significant difference in pre- and post-treatment scores of DA and rumination between remitters and non-remitters.

## Materials and methods

### Participants and procedures

Participants were recruited from the psychiatry outpatient clinics of the University of Health Sciences (UHS) Bursa Yuksek Ihtisas Training and Research Hospital (TRH), from June 2019 to December 2019. The study sample consisted of 110 voluntary participants who were diagnosed with a first episode of MD by a psychiatrist, in accordance with the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) diagnostic criteria. The inclusion criteria were: (1) the Hamilton Depression Rating Scale (HDRS) scores of 16 and above, (2) the Clinical Global Impression Scale (CGI) – Severity scores of 3 and above, (3) 18–65 years of age, (4) education level of 8 years and above. The presence of intellectual disability, alcohol or substance use disorders, serious neurological disorders (i.e., Parkinson's disease), schizophrenia or other psychotic disorders, bipolar disorder or other mood disorders, comorbid personality disorders and pregnancy or breastfeeding were determined as the exclusion criteria. Written informed consent was obtained from all participants. The study protocol was approved by UHS Bursa Yuksek Ihtisas TRH Ethics Committee with 2011-KAEK-25 2019/05-10 protocol code on May 22, 2019.

All participants were assessed with the HDRS, the CGI, the Dysfunctional Attitude Scale Form A (DAS-A), the Ruminative Responses Scale-Short Form (RRS-SF), the Negative Beliefs about Rumination Scale (NBRS), the Positive Beliefs about Rumination Scale (PBRS) before the onset of SSRI treatment and 2-months after. The scales were given in a single session in a randomised order. Naturalistic treatment with sertraline, paroxetine, fluoxetine or escitalopram was administered and a second psychiatric assessment was done after one month. Twenty-one patients who did not continue the treatment were excluded. In 17 of 89 patients with routine treatment, drug dosages were increased due to their clinical status at the end of the first month of treatment. Of the 89 patients, 31 patients were given fluoxetine 20 mg/day, 23 patients were given sertraline 50 mg/day, 18 patients escitalopram 10 mg day, and 17 patients were given paroxetine 20 mg/day, initially. At the end of the four weeks, in 3 patients taking fluoxetine dosage was increased to 40 mg/day, in 6 patients taking sertraline dosage was increased to 100 mg/day, and in 6 patients taking escitalopram dosage was increased to 40 mg/day, and in 2 patients taking paroxetine dosage was increased to 40 mg/day. Patients with the HDRS scores of 7 or below and the CGI – Improvement score of 2 or below at the 2nd-month evaluation were considered as remitters.

### Measures

#### Demographic data form
Prepared by the researchers within the framework of the research hypothesis.

**Clinical Global Impression Scale (CGI):** The CGI was developed to evaluate the clinical course of psychiatric disorders and can be applied to patients of all ages. It consists of three subscales: disease severity, improvement and efficacy. Severity score (CGI-S) is rated between 1 and 7 at the time of assessment; 1 = normal, not at all ill; 2 = borderline mentally ill; 3 = mildly ill; 4 = moderately ill; 5 = markedly ill; 6 = severely ill; 7 = among the most extremely ill patients. CGI-Improvement (CGI-I) evaluates how much the patient has changed from the baseline on a scale of 1 to 7; 1 = very much improved since the initiation of treatment; 2 = much improved; 3 = minimally improved; 4 = no change from baseline (the initiation of treatment); 5 = minimally worse; 6 = much worse; 7 = very much worse since the initiation of treatment. The third part of the scale, CGI-Efficacy Index assessed over 4 points and was not used in the study (Guy, 1976).

**Hamilton Depression Rating Scale (HDRS):** The HDRS measures the level of depression and change in the severity of depressive symptoms and facilitates follow-up during treatment (Williams, 1988). The Turkish version of the 17-item scale was used in our study (Akdemir et al., 1996). The maximum total score that can be taken is 53 points. Scores of 0–7 = no depression (or post-treatment remission), 8–15= mild depression, 16–28= moderate depression, and 29 and above = severe depression.

**Dysfunctional Attitude Scale – Form A (DAS-A):** The DAS-A is a self-report scale, consisting of 40 items on a 7-point Likert scale developed to measure dysfunctional attitudes and beliefs (Weismann & Beck 1978). A validity and reliability study of the Turkish version was conducted and four factors including "perfectionistic attitude," "need for approval," "autonomous attitude" and "tentativeness" were reported (Sahin & Sahin, 1992). The total score ranges between 40 and 280, with higher scores indicating increasingly dysfunctional attitudes.

**Ruminative Responses Scale-Short Form (RRS-SF):** The RRS-SF is a 10-item, 4-point Likert-type self-report scale that measures the degree to which ruminative coping strategies are used. By analysing a series of key components with and without confounding factors, the researchers identified two factors as "brooding" and "reflective pondering" with five items in each (Treynor et al., 2003). A reliability and validity study of the Turkish version of the scale has been conducted (Erdur-Baker & Bugay, 2012).

**Negative Beliefs about Rumination Scale (NBRS):** The NBRS is a 4-point Likert-type self-report scale with 13 items, assessing negative beliefs on the disadvantages of rumination. It consists of two sub-scales of "uncontrollability and danger of ruminations" and "metacognitive beliefs concerning the negative interpersonal and social consequences of rumination" (Papageorgiou & Wells 2001a). The validated Turkish version of the NBRS was used in this study (Yılmaz et al., 2015).

**Positive Beliefs about Rumination Scale (PBRS):** The PBRS is a 9-item, 4-point Likert-type self-report scale that assesses positive metacognitive beliefs about the benefits of ruminating (Papageorgiou & Wells 2001b). A validity and reliability study of the Turkish version of the PBRS was conducted (Yı lmaz et al., 2015).

### Statistical analysis

The normal distribution of each variable was tested using the Shapiro Wilk test. The continuous variables were presented as median (min-max) and mean ± standard deviation, whereas categorical variables were reported as $n$ (%). Based on normality results, the scores of DAS-A and rumination scales (RRS-SF, NBRS and PBRS) obtained before and after treatment was analysed by paired $t$-test or Wilcoxon signed rank test. Independent samples $t$-test, Mann-Whitney $U$ test and Pearson chi-square test were used to compare the two groups of patients in remission and non-remission. The factors affecting remission were investigated by logistic regression analysis. Going through remission was evaluated as the dependent variable in the logistic regression analysis. Pre-treatment measurements of the RRS, PBRS, NBRS, DAS-A scales, the difference scores obtained by subtracting pre-treatment period scores from post-treatment period scores, gender, education, and marital status were included in the analysis as independent variables. Each variable was first analysed with univariate logistic regression analysis. Variables meeting the $p < 0.25$ criterion were included in the multivariate analysis. As a result of the analyses, the scores obtained from the rumination scales and DAS were included in the multivariate logistic regression analysis. Variables included in the model were determined in the final step

**Table 1.** Demographic characteristics of participants ($n = 89$).

| | Median (Minimum:Maximum)/$n$(%) |
|---|---|
| Gender | |
| Woman | 65 (%73) |
| Male | 24 (%27) |
| Marital status | |
| Single | 38 (%42.70) |
| Married | 43 (%48.30) |
| Divorced | 8 (%9) |
| Duration of education (year) | 12 (5:17) |
| Training | |
| Primary | 21 (%23.60) |
| High school | 34 (%38.20) |
| University | 34 (%38.20) |
| Profession | |
| Housewife | 29 (%32.60) |
| Self-employed | 20 (%22.50) |
| Student | 18 (%20.20) |
| Unemployed | 13 (%14.60) |
| Officer | 9 (%10.10) |

of the multivariate analysis by using the backward selection method as the variable selection method among these variables. The results are reported together with the model significance of the final step and the Hosmer-Lemeshow test result. All analyses were conducted by using SPSS 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.). $P$ value of less than 0.05 was regarded as statistically significant.

### Results

Of the 110 patients participating in the study, 73% were female and the mean age was 32 (18–59). The sociodemographic profile of the study sample is shown in Table 1. There were significant differences between pre- and post-treatment scores on DAS-A, RRS-SF, NBRS and PBRS scales ($p$ values < 0.001). The comparison of pre-treatment and post-treatment scores of total and subscales of DAS-A is presented in Table 2. The comparison of pre-treatment and post-treatment scores of total and subscales of RRS-SF, NBRS and total scores of PBRS is presented in Table 3.

The decrease in DAS-A autonomous attitude scores was more in remitted patients ($p = 0.008$). The pre-treatment and post-treatment DAS-A scores, and the difference scores which are obtained by subtracting the pre-treatment scores from post-treatment scores, are shown in Table 4.

The difference ($\Delta$PsT→PrT) scores of RRS-SF reflective pondering as calculated by subtracting pre-treatment scores from post-treatment scores were higher in remitted patients compared to non-remitted patients ($p = 0.013$). The mean pre-treatment RRS-SF brooding and RRS-SF total scores were lower in the remission group than that of the non-remission group ($p = 0.011$, $p = 0.019$, respectively). The median values of the difference scores of RRS-SF brooding and RRS-SF total were also higher in the remission group compared to the non-remission group ($p < 0.001$, $p = 0.001$, respectively).

The difference ($\Delta$PsT→PrT) score of NBRS uncontrollability and danger of ruminations subscale was found to be significantly higher in remitted patients compared to non-remitted patients ($p = 0.001$). The mean pre-treatment NBRS total score was significantly lower in the remission group as well ($p = 0.026$). Additionally, the decrease observed in PBRS total scores in the post-treatment period was significantly higher in the remission group compared to the non-remission group ($p < 0.004$) (see Table 5 for difference ($\Delta$PsT→PrT) scores, calculated by subtracting post-treatment scores from pre-treatment scores).

**Table 2.** Comparison of pre-treatment and post-treatment dysfunctional attitudes scale scores.

| DAS-A | Obtained scores | | p |
|---|---|---|---|
| | Pre-treatment | Post-treatment | |
| Perfectionistic attitude | $58.33 \pm 19.53$ (22:106) | $47.89 \pm 16.66$ (20:96) | $t(88) = 10.05$, $<0.001^b$ |
| Need for approval | $47.52 \pm 11.23$ (27:73) | $41.69 \pm 10.14$ (13:65) | $t(88) = 6.96$, $<0.001^b$ |
| Autonomous attitude | $23.57 \pm 5.24$ (11:34) | $19.33 \pm 5.51$ (6:32) | $t(88) = 7.96$, $<0.001^b$ |
| Tentativeness | 18 (10:30) | 14 (7:26) | $Z = -6.98$, $<0.001^a$ |
| Total | $147.70 \pm 33.38$ (87:223) | $124 \pm 30.99$ (49:207) | $t(88) = 11.01$, $<0.001^b$ |

DAS-A: Dysfunctional Attitudes Scale.
The data are presented as mean ± standard deviation (minimum: maximum) and median (minimum: maximum) values.
[a]Wilcoxon marked sequence test, [b]Paired samples *T*-test.

**Table 3.** Comparison of pre-treatment rumination and post-treatment rumination scale scores.

| Rumination scales | Obtained scores | | p |
|---|---|---|---|
| | Pre-treatment | Post-treatment | |
| RRS-SF | | | |
| Reflection | 12 (7:20) | 8 (5:18) | $Z = 7.75$, $<0.001$ |
| Brooding | 15 (9:20) | 10 (5:20) | $Z = -7.72$, $<0.001$ |
| Total | 27 (17:39) | 18 (11:34) | $Z = -7.95$, $<0.001$ |
| NBRS | | | |
| Uncontrollability and danger | 10 (6:24) | 14 (6:22) | $Z = -6.87$, $<0.001$ |
| Interpersonal and social consequences | 13 (7:26) | 10 (7:25) | $Z = -5,70$, $<0.001$ |
| NBRS total | 31 (15:48) | 25 (13:43) | $Z = -6.92$, $<0.001$ |
| PBRS | | | |
| Total | 24 (9:36) | 20 (9:36) | $Z = -6.91$, $<0.001$ |

RRS-SF: Ruminative Responses Scale-Short Form; NBRS: Negative Beliefs about Rumination Scale; PBRS: Positive Beliefs about Rumination Scale.
The data are presented with median (minimum: maximum) values.
[a]Wilcoxon marked sequence test.

**Table 4.** Comparison of dysfunctional attitudes scale scores between remission and non-remission groups.

| DAS-A | Remission | | p |
|---|---|---|---|
| | Remitted ($n = 54$) | Non-remitted ($n = 35$) | |
| Perfectionistic attitude | | | |
| Pre-treatment (PrT) | $56.78 \pm 18.61$ (22:89) | $60.71 \pm 20.92$ (28:106) | $t(87) = -0.93$, $0.356^b$ |
| Post-treatment (PsT) | $45.41 \pm 15.50$ (20:75) | $51.71 \pm 17.86$ (24:96) | – |
| $\Delta_{PsT \rightarrow PrT}$ | $-11$ ($-41$:34) | $-7$ ($-25$: $-1$) | $Z = -1.80$, $0.072^a$ |
| Need for approval | | | |
| Pre-treatment (PrT) | $46.20 \pm 11$ (27:73) | $49.09 \pm 11.55$ (27:72) | $t(87) = -1.06$, $0.291^b$ |
| Post-treatment (PsT) | $39.87 \pm 10.49$ (13:60) | $44.49 \pm 8.99$ (25:65) | – |
| $\Delta_{PsT \rightarrow PrT}$ | $-6$ ($-46$:19) | $-5$ ($-25$:9) | $Z = -1.19$, $0.234^a$ |
| Autonomous attitude | | | |
| Pre-treatment (PrT) | 24 (12:35) | 25 (11:31) | $Z = -0.30$, $0.768^a$ |
| Post-treatment (PsT) | 19 (6:32) | 22 (10:29) | – |
| $\Delta_{PsT \rightarrow PrT}$ | $-5$ ($-28$:14) | $-3$ ($-8$:11) | $Z = -2,64$, $0.008^a$ |
| Tentativeness | | | |
| Pre-treatment (PrT) | $17.83 \pm 3.97$ (10:29) | $19.06 \pm 3.99$ (12:30) | $t(87) = -1.43$, $0.156^b$ |
| Post-treatment (PsT) | $14.54 \pm 3.82$ (7:26) | $15.89 \pm 3.76$ (9:24) | – |
| $\Delta_{PsT \rightarrow PrT}$ | $-2.50$ ($-18$:3) | $-4$ ($-11$:7) | $Z = -0.76$, $0.446^a$ |
| Total | | | |
| Pre-treatment (PrT) | $144.67 \pm 33.39$ (87:208) | $152.46 \pm 33.30$ (96:223) | $t(87) = -1.08$, $0.285^b$ |
| Post-treatment (PsT) | $118.11 \pm 30.34$ (49:173) | $133 \pm 30.21$ (78:207) | – |
| $\Delta_{PsT \rightarrow PrT}$ | $-24.50$ ($-133$:54) | $-19$ ($-45$:20) | $Z = -1.74$, $0.081^a$ |

DAS-A: Dysfunctional Attitudes Scale.
The data are presented as mean ± standard deviation (minimum: maximum) and median (minimum: maximum).
$\Delta_{PsT \rightarrow PrT:}$ The difference score is calculated by subtracting the pre-treatment scores from the post-treatment scores. [a]: Mann-Whitney *U* Test, [b]: Independent samples *t*-test.

RRS, PBRS, NBRS, DAS-A scores, gender, education and marital status were added to a single variable logistic regression analysis to determine the factors affecting remission. Then, the variables reaching the $p < 0.25$ criterion after primary analysis (rumination scales and DAS-A) were included in the multiple logistic regression analysis. In order to determine the variables to be included in the final step in the regression model, a backward selection method was adopted to eliminate the variables entering the model and the findings of the final step of the analysis are given in Table 6. The logistic regression model was significant ($p < 0.001$) and the dataset was fit to the regression model ($p = 0.438$). When the table is examined, it is seen that with a one-unit increase in the difference score of RRS-SF reflective pondering, the probability of patients entering remission would increase 2.88 times. Moreover, after a one-unit increase in RRS-SF brooding pre-treatment score, the probability of patients remit would decrease by 55%. With a one-unit increase in the difference RRS difference score as obtained by subtracting pre-treatment RRS scores from post-treatment RRS-SF scores, the probability of remission decreased by 65%, which means that with relatively

**Table 5.** Comparison of rumination scale scores between remission and non-remission groups.

| | Remission | | |
|---|---|---|---|
| Rumination scales | Remitted ($n = 54$) | Non-remitted ($n = 35$) | P |
| **RRS-SF** | | | |
| Reflection | | | |
| Pre-treatment (PrT) | 12.24 ± 2.73 (7:19) | 13.17 ± 3.08 (7:19) | $t(87) = -1.50$, 0.138[b] |
| Post-treatment (PsT) | 7.18 ± 2.02 (5:14) | 9.80 ± 2.96 (5:18) | – |
| $\Delta_{PsT \to PrT}$ | −5.06 ± 2.45 (−11:0) | −3.38 ± 3.37 (−10:4) | $t(57) = -2.55$, 0.013[b] |
| Brooding | | | |
| Pre-treatment (PrT) | 13.96 ± 2.34 (9:19) | 15.37 ± 2.73 (9:20) | $t(87) = -2.60$, 0.011[b] |
| Post-treatment (PsT) | 9.32 ± 1.84 (5:15) | 12.86 ± 2.44 (9:20) | – |
| $\Delta_{PsT \to PrT}$ | −4 (−12:0) | −2 (−7:3) | $Z = -3.90$, <0.001[a] |
| Total | | | |
| Pre-treatment (PrT) | 26.20 ± 4.27 (18:38) | 28.54 ± 4.87 (17:39) | $t(87) = -2.39$, 0.019[b] |
| Post-treatment (PsT) | 16.50 ± 3.43 (11:29) | 22.66 ± 4.86 (15:34) | – |
| $\Delta_{PsT \to PrT}$ | −9 (−20: −2) | −6 (−16:6) | $Z = -3.42$, 0.001[a] |
| **NBRS** | | | |
| Uncontrollability and danger | | | |
| Pre-treatment (PrT) | 17 (6:24) | 19 (10:23) | $Z = -1.68$, 0.093[a] |
| Post-treatment (PsT) | 13 (6:20) | 16 (10:22) | – |
| $\Delta_{PsT \to PrT}$ | −3 (−10:11) | −2 (−8:2) | $Z = -3.20$, 0.001[a] |
| Interpersonal and social consequences | | | |
| Pre-treatment (PrT) | 12.50 (7:24) | 15 (7:26) | $Z = -1.90$, 0.062[a] |
| Post-treatment (PsT) | 10 (7:25) | 11 (7:24) | – |
| $\Delta_{PsT \to PrT}$ | −3 (−17:13) | −3 (−10:5) | $Z = -0.70$, 0.482[a] |
| Total | | | |
| Pre-treatment (PrT) | 29.83 ± 7.94 (15:45) | 33.83 ± 8.38 (17:48) | $t(87) = -2.27$, 0.026[b] |
| Post-treatment (PsT) | 23.72 ± 5.75 (13:42) | 28.31 ± 5.96 (20:43) | – |
| $\Delta_{PsT \to PrT}$ | −6.50 (−27:24) | −5.51 (−14:5) | $Z = -0.96$, 0.337[a] |
| **PBRS** | | | |
| Total | | | |
| Pre-treatment (PrT) | 23.89 ± 5.58 (9:36) | 23.20 ± 6.24 (10:36) | $t(87) = -0.54$, 0.588[b] |
| Post-treatment (PsT) | 19.04 ± 5.68 (9:36) | 20.94 ± 5.49 (9:30) | – |
| $\Delta_{PsT \to PrT}$ | −4.50 (−22:8) | −3 (−11:18) | $t(67) = 0.53$, 0.004[a] |

RRS-SF: Ruminative Response Scale-Short Form; NBRS: Negative Beliefs about Rumination Scale; PBRS: Negative Beliefs about Rumination Scale.
The data are presented as mean ± standard deviation (minimum: maximum) and median (minimum: maximum).
$\Delta_{PsT \to PrT}$: The difference score is calculated by subtracting the pre-treatment scores from the post-treatment scores.
[a]Mann-Whitney $U$ Test, [b]Independent samples $t$-test.

**Table 6.** Factors affecting remission.

| | Wald | OR | p-value |
|---|---|---|---|
| **Rumination scales** | | | |
| Ruminative response scale | | | |
| Reflection | | | |
| $\Delta_{PsT \to PrT}$ | 10.94 | 2.88 | <0.001 |
| Brooding | | | |
| Pre-treatment (PrT) | 16.31 | 0.45 | <0.001 |
| Total | | | |
| $\Delta_{PsT \to PrT}$ | 19.59 | 0.35 | <0.001 |
| **Dysfunctional** | | | |
| Attitudes scale | | | |
| Perfectionistic attitude | | | |
| Pre-treatment (PrT) | 3.14 | 0.84 | <0.001 |
| Need for approval | | | |
| Pre-treatment (PrT) | 4.78 | 0.78 | <0.001 |
| Tentativeness | | | |
| Pre-treatment (PrT) | 2.73 | 0.79 | <0.001 |
| Total | | | |
| Pre-treatment (PrT) | 3.99 | 1.19 | <0.001 |

Model $\chi^2 = 53.27$; $p < 0.001$
Hosmer and Lemeshow Test: $p = 0.438$
OR: Odds ratio.
$\Delta_{PsT \to PrT}$: The difference score is calculated by subtracting the pre-treatment scores from the post-treatment scores.

higher post-treatment scores after treatment, the probability of remission decreased. It was also revealed that a one-unit increase in pre-treatment DAS-A perfectionistic attitude, DAS-A need for approval, and DAS-A tentativeness would result in a 16%, 22% and 21% decrease in remission rates, respectively. Lastly, a one-unit increase in pre-treatment DAS-A total score would increase the remission rate by 1.19 times.

## Discussion

In this study, we aimed to investigate whether the DA and ruminations would change over the course of SSRI treatment without psychotherapy and the impact of DA and ruminations on treatment response in patients with the first episode of major depression. Our study results showed that SSRI treatment provides a decrease in all measurements of DA and ruminations. This is also evident in previous studies that antidepressants provide a decrease in DAs and ruminations, in compliance with response style theory (Pedrelli et al., 2008; Schmaling et al., 2002; Shankman et al., 2013; Wilkinson & Goodyer, 2008). To the best of our knowledge, there are no studies reporting that the antidepressants reduced metacognitions on rumination, as we found in this study.

When the effectiveness of SSRI treatment on DA was compared between the groups of patients with remission and non-remission, all subscale scores except the autonomous attitudes differed significantly between the groups; perfectionistic attitude was found to be associated with poor response to SSRIs. A perfectionistic attitude is related to having high personal standards, interpreting mistakes and shortcomings as inadequacies, and worrying about being evaluated negatively by others (Cane et al., 1986). In a previous study investigating the predictors of poor response to SSRI treatment in patients with depression, perfectionism was found to be associated with poor response to SSRIs, congruent with our results (Salazar-Fraile et al., 2018). Perfectionism is a transdiagnostic process related to anxiety disorders as well as depression and poor response to SSRIs (Egan et al. 2011; Selvi et al. 2011). The researchers have also suggested that

the relationship between perfectionism and poor response to treatment may be related to the tendency of individuals with high levels of perfectionism to be dissatisfied with the applied treatment method and to evaluate the method as inadequate (Egan et al. 2011).

When we compared the effectiveness of SSRI treatment on DA in the remission and non-remission groups, only autonomous attitude difference scores did differ significantly between the study groups. Therefore, in patients with depression who remit with SSRIs, autonomous attitudes also improved. There was no significant difference in the need for approval and tentativeness subscale scores between the groups. Autonomous attitude is characterised by the one's positive, functional assumptions about oneself and acting independently of the needs for environmental approval, support and affection, and the need for approval relates to the fact that one's self-worth and happiness depend on received approval, support and love from others, whereas tentativeness is more associated with one's flexible and changing attitudes and positive and functional assumptions about life (Cane et al., 1986; Savaşır and Şahin 1997). In other words, the attitudes in which interpersonal boundaries and autonomy are lost that are also associated with Turkish culture with collectivist cultural characteristics did not respond to SSRI treatment. As there is a poor response to SSRI treatment in patients with perfectionistic attitudes, need for approval and tentativeness, it may be beneficial to add psychotherapies targeting to remediate these attitudes in the treatment plan.

Pre-treatment RRS-SF brooding and RRS-SF total scores were significantly higher in the non-remission group than that in the remission group. One of the reasons for this difference may be that while reflective pondering may have functional consequences for the patient through cognitive efforts to solve depressive symptoms, brooding causes voluntary withdrawal from problem-solving by avoidance and denial, resulting in worsened depressive mood (Burwell & Shirk, 2007; Treynor et al., 2003).

In our study, the mean pre-treatment NBRS total score of the non-remission group was found to be significantly higher than that of the remission group. According to the metacognitive theory of depression, it is evident that both positive and negative metacognitive beliefs about ruminations cause exacerbation of depressive symptoms (Papageorgiou & Wells, 2003). In our study, there was no difference between pre-treatment PBRS scores, and although not significant, the pre-treatment PBRS scores were higher in the remission group. In studies conducted in Eastern societies, researchers have suggested that positive beliefs about rumination may not only be a maladaptive self-focus and exacerbate depressive symptoms, but they may also contribute to adaptively focusing on depressive symptoms and may help regulation of depression similar to reflective pondering (Rafique, 2010; Takano & Tanno, 2010). Although the correlation between PBRS and depressive symptoms was confirmed in the validity and reliability study of the PBRS and NBRS performed in a Turkish non-clinical sample, the expected correlation was not observed in the depression group (Yılmaz et al., 2015).

In previous studies, researchers attempted to explain the effects of SSRIs on ruminations in terms of biological basis. While decreased connectivity between the anterior cingulate cortex and frontal gyrus is positively correlated with depression levels, it is negatively correlated with rumination levels (Connolly et al., 2013). Antidepressants or atypical antipsychotics with a similar mechanism to that of antidepressants might reduce ruminations by reversing the deficits in the anterior cingulate cortex (Han et al., 2013; Hou & Lai, 2014; Rittmannsberger, 2019). Adding low-dose atypical antipsychotics to the treatment protocol has reduced ruminations in treatment-resistant cases that did not respond adequately to previous antidepressant treatments. Our study sample consisted of patients with no history of antidepressant use, so this may explain the effectiveness of antidepressants on ruminations.

When we compared the post-treatment rumination scale scores of the remission group to the non-remission group, there was a significant difference in the NBRS subscale of the metacognitive beliefs concerning the uncontrollability and danger of rumination. So, patients with depression having metacognitive beliefs concerning the uncontrollability and danger of rumination responded poorly to SSRIs, and the addition of psychotherapies to remediate these ruminations may be beneficial in the treatment of depression.

Our study has some limitations. The sample included only Turkish participants. Similar studies involving participants from different cultures may be more accurate for understanding cultural factors. A structured scale was not used for the clinical evaluation of personality disorders in our study and this might have affected the results of this study.

Despite these limitations, our study results show that before applying SSRIs to patients diagnosed with the first episode of MD, detection of DAs and brooding type of ruminations are associated with poor response to treatment; and in patients who remit with SSRI treatment, a decrease in levels of positive metacognitions, uncontrollability and danger type of negative metacognitions, only autonomous type of dysfunctional attitudes and brooding type of rumination are also more than non-remitted patients. So, in non-remitted patients with the first episode of MD besides depressive symptoms, dysfunctional attitudes or rumination levels also tend to decrease less, so effective treatment modalities should include therapies addressing these cognitions or metacognitions; with no need for multiple drug use. Evaluation of these cognitive and metacognitive domains with a structured scale before starting an SSRI treatment might decrease unnecessary antidepressant treatment for this sub-group of patients with the first episode of major depression.

## Authors contributions

İlker Özben: Writing – original draft, Conceptualisation. Güliz Şenormancı: Writing – original draft. Onur Okan Demirci: Writing – original draft. Ömer Şenormancı : Writing – original draft, Conceptualisation.

## Disclosure statement

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