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Cognitive distortions mediate the relationship between defense styles and depression in female outpatients

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ABSTRACT – *Background and Objectives:* Some clinicians use different psychotherapeutic methods in combination in their practice. These combinations reflect the need for more rigorous research on the common pathways which these different therapy orientations may be utilizing, and one way to identify these pathways would be to investigate some core assessment tools or conceptual foundations of these two different approaches.

Aim: The aim of the present study was to evaluate the relationship between defense mechanisms and cognitive distortions, and to identify the mediating role of cognitive distortions between defense styles and depression.

Methods: A total of 342 female psychiatric outpatients aged 18 and older were recruited. A diagnostic interview and rating of the depression severity were undertaken, and the Cognitive Distortion Scales and the Defense Style Questionnaire were completed by the participants. Hierarchical regression analyses were conducted to test for the direct and indirect effects of the defense styles.

Results: Cognitive distortions and defense mechanisms were both correlated with the severity of depression, but the correlations were stronger for the former.

Conclusions: The findings are suggestive of the mediating effect of cognitive distortions between defense mechanisms and the severity of depression.

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Introduction

Currently the most widely combined psychotherapeutic methods are cognitive and behavioral, followed by cognitive and psychoanalytical, and cognitive and humanistic[1]. Some clinicians use different psychotherapeutic methods in combination in their practice[2]. These combinations reflect the need to more rigorous research on the common pathways these different therapy orientations may be utilizing, and one way to identify these pathways would be to investigate some core assessment tools or conceptual foundations of these two different approaches. For cognitive therapists, automatic thoughts, underlying schemas, cognitive distortions, coping strategies, etc. could be listed among the core features[3,4], whereas for psychoanalysts, defense mechanisms, interpretation of dreams, transference, free association, resistance, etc. may be listed[5].

Among the many other distinct features of cognitive therapy, one of the most widely assessed and intervened concept is the cognitive distortions[2,3,6,7]. Cognitive distortions may be evaluated by a couple of instruments, e.g. the Cognitive Distortion Scales (CDS)[8]. The CDS measure five types of cognitive distortions, i.e. subscales, each consisting of 8 items found among patients: (i) Self-Criticism (SC), (ii) Self-Blame (SB), (iii) Helplessness (HLP), (iv) Hopelessness (HOP), and (v) Preoccupation with Danger (PWD). The SC subscale reflects how the patients criticize or devalue oneself, and may also be labeled low self-esteem[9]. Individuals scoring high on this scale view themselves from a biased perspective, and report repetitive negative thoughts about being bad or unacceptable people. The SC subscale is closely related to Beck's cognitive triad, and reflects the way how negatively a person evaluates his self-worth[3,10]. The SB subscale evaluates how much patients blame themselves for negative, unwanted events that occurred in their life. Patients who score high on this subscale have negative internal attributions about the meaning of adverse life experiences, and hold themselves responsible for these negative outcomes. The HLP subscale reflects thoughts about being unable to control or influence important negative aspects of one's life. Patients who score high on the HLP subscale believe that their efforts to change an unwanted or problematic situation will be unsuccessful, which may lead to passivity or avoidance. The HOP subscale measures how much patients believe that their future is miserable, and how much they think that they will suffer or fail. Patients who score high on the HOP subscale are often characterized as pessimistic, and they may avoid activities with a potentially positive future outcome. The SB, HLP and HOP subscales are closely related to the hopelessness theory of depression[11,12], and may reflect the patient's internal, global and stable attributions, and biased views of the future. The HOP subscale has also been implied to be related to suicidal tendencies[9]. The SC, SB, HLP, and HOP subscales are representative of cognitive distortions related to depression. The PWD subscale evaluates how much the patient views the world as a dangerous place. Patients with elevated PWD scores are hypervigilant to danger, and they may assume that even benign circumstances or events contain risk of emotional or physical injury[9]. The PWD subscale is more closely related to anxiety, and corresponds to the overestimation of the encountered or envisioned threat or danger, and the underestimation of resources and coping abilities[3,13].

For psychodynamic concepts, the assessment via instruments is less preferred. Yet, there are some scales to identify the defense mechanisms, e.g. the Defense Style Questionnaire (DSQ)[14]. The DSQ consists of 3 subscales, i.e. immature defenses (ID), neurotic defenses (ND), and mature defenses

(MD). The ID subscale measures the projection, passive aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting, rationalization, and somatization; the ND subscale measures the undoing, pseudoaltruism, idealization, and reaction formation, and the MD subscale measures the sublimation, humor, anticipation, and suppression defenses. Although some authors consider that some of these defense mechanisms may be classified as primitive[15], the DSQ does not make this distinction. The defense mechanisms in the MD subscale are associated with successful functioning. Patients scoring high on the ND subscale generally repeat behaviors that they find painful or unsatisfying. On the other hand, patients who score high on the ID subscale report much less satisfying lives[15]. Theoretically, it is assumed that when a patient faces a stressful event, the first assessment step regarding the activation and utilization of defense mechanisms depends on whether the patient recognizes the stress or ignores it completely. If the patient ignores the stress, then it may be assumed that defense mechanisms in the primitive domain, e.g. denial, avoidance, projection, may be activated. On the other hand, if the patient recognizes the stress, the next assessment step focuses on whether the patient regards the stress as something within his or her responsibility or control, or locates it somewhere outside of himself / herself. An external location would signal the activation of immature defense mechanisms. Yet, if the patient perceives the stress within the responsibilities or control of himself / herself, then a third assessment step would involve the evaluation of the cognitive and emotional contents of the stressful event. The lack of an integrated thought and emotion might characterize the utilization of neurotic defense mechanisms. The final step of assessment would point out to a patient who recognizes the stress, regards it as part of his or her life, thinks that the stressful event's resolution rests on his / her hands, and integrates the cognitive and emotive contents of the stress. This would mean that the patient has activated mature defenses[15].

The aim of the present study was to evaluate the relationship between defense mechanisms and cognitive distortions, and to identify the mediating role of cognitive distortions between defense styles and depression.

We hypothesized that defense mechanisms, which are according to the psychoanalytical theory essentially products of the unconscious, may be mediated by the products of a conscious mind through cognitive distortions to affect the severity of depression in female psychiatric outpatients.

Materials and methods

Sample

For the present study, a total of 342 female psychiatric outpatients aged 18 and older presenting to one secondary, and one tertiary healthcare services in two different cities were recruited. Participants were excluded from the study if they (i) were diagnosed with any comorbid psychotic disorder, bipolar mood disorder, organic mental disorder, substance use disorder, and / or mental retardation, (ii) suffered from a medical / neurologic disorder not currently under control, (iii) were suicidal at the time of the intake interview, (iv) suffered from very severe depression, and (v) had a history of head trauma, brain surgery, or electroconvulsive therapy.

Instruments of assessment

Demographic Data Form: This form was developed by the researchers and the age, level of education, and marital status of the participants were recorded onto it.

Mini International Neuropsychiatric Interview (MINI)[16]: The MINI is a structured clinical diagnostic interview for mental disorders. In the present study, all participants were diagnosed by experienced clinicians according to the *Diagnostic and Statistical Manual of Mental Disorders* version IV (DSM-IV)[17] with the Turkish version of the MINI[18].

Inventory of Depressive Symptomatology – Clinician Version-30 (IDS-C_{30})[19,20]: This is a 30-item 4-point clinician rated scale designed to screen for, or to assess the severity, and all the criterion symptom domains designated by the DSM-IV[17], as well as commonly associated symptoms (e.g. anxiety, irritability) and items relevant to melancholic, or atypical symptom features of depression, to diagnose a major depressive episode. The seven day period prior to assessment is the usual time frame for assessing symptom severity. It was shown to be sensitive to change, with medications, psychotherapy, or somatic treatments, and was used in non-psychotic, psychotic, postpartum, minor, and bipolar depression, dysthymia, and depression in medical comorbidities[21]. The IDS-C_{30} is scored by summing responses to 28 of the 30 items to obtain a total score ranging from 0 to 84. Either appetite increase or decrease, and either weight increase or decrease, but not both, are used to calculate the total score[19]. Cronbach's α for the IDS-C_{30} were reported to range from 0.75 to 0.94[21]. The Cronbach's α of the Turkish version of the IDS-C_{30} was 0.88[22], and in the present study the Cronbach's α was also calculated to be 0.88. The IDS-C_{30} is sensitive to change in depressive severity in a manner consistent with the Hamilton Rating Scale for Depression (HRSD)[23] and the Beck Depression Inventory (BDI)[24], even demonstrating a greater sensitivity to change in the lower range of scores reported by outpatients patients with major depression[19]. IDS-C_{30} total scores were comparable to those obtained by the $HRSD_{17}$, the Montgomery Asberg Depression Rating Scale (MADRS)[25], and the BDI, with correlations ranging from 0.81 to 0.95[12]. The Turkish version of the IDS-C30 was also reported to significantly correlate with the $HRSD_{17}$ ($r = 0.66$)[22]. Cut-off scores for the severity of depression as determined by the IDS-C_{30} were defined as follows: ≤ 11, none; 12-23: mild; 24-36, moderate; 37-46, severe; ≥ 47, very severe. The Turkish version of the IDS-C_{30} was used in this study[22], and the total score was calculated for the statistical analyses.

Cognitive Distortion Scales (CDS)[8]: This is a 40-item self-report scale developed to assess cognitive distortions. Each item is rated according to its frequency of occurrence over the prior month, using a 5-point scale ranging from 1 (never) to 5 (very often). The CDS subscales are psychometrically reliable, and have construct, predictive, and convergent validity. Higher scores on a subscale represent that those cognitive distortions are more frequently reported by the patients. The Cronbach's α values for these subscales were reported 0.93 (self-criticism, SC), 0.92 (self-blame, SB), 0.97 (helplessness, HLP), 0.94 (hopelessness, HOP), and 0.89 (preoccupation with danger, PWD)[8]. The Turkish version's Cronbach's α values were 0.91 (SC), 0.88 (SB), 0.83 (HLP), 0.90 (HOP), and 0.78 (PWD)[26]. In the present study, the Cronbach's α values of the subscales were calculated 0.90 (SC), 0.90 (SB), 0.91 (HLP), 0.92 (HOP), and 0.89 (PWD). For the present study, the Turkish version of the CDS was used[26], and only the total score of the CDS was used in the analyses.

Defense Style Questionnaire-40 (DSQ)[14]: The DSQ is a 40-item self-report measure used to identify unconscious defense mechanisms of the ego. Each defense mechanism is represented by two statements. The respondents are asked to rate how much they agree with a given statement ranging from 1 (completely

disagree) to 9 (completely agree). Higher scores on a subscale correspond to the more frequent endorsement of the relevant defense mechanisms. The Cronbach's α values of these subscales were 0.80 (immature defenses, ID), 0.58 (neurotic defenses, ND), and 0.68 (mature defenses, MD)[14]. The Turkish version's Cronbach's α values were reported 0.83 (ID), 0.61 (ND), and 0.70 (MD)[27]. In the present study, the Cronbach's α values for the subscales were calculated 0.80 (ID), 0.63 (ND), and 0.71 (MD). The Turkish version of the DSQ was used in this study[27]. For statistical analyses, the total scores of the subscales were computed.

Procedure

The diagnostic interview and rating of the depression severity were undertaken by trained psychiatrists face to face at intake, and the self-report measures were completed by the participants after the intake interview. All the questionnaires were administered in a totally random order. It took about 15-20 minutes for the questionnaires to be completed. No compensation of any sort was offered. All participants signed a written informed consent before the study, and the respective local ethics committees approved the study design.

Statistical analysis

All analyses were performed using *IBM SPSS for Windows, Version 22.0*[28]. Demographic and psychometric data of the participants were analyzed by descriptive statistics. After calculating bivariate Pearson correlations among the variables of the study, a series of hierarchical regression analyses were conducted to test for the direct and indirect effects of the subscale scores of the defense styles, and to test whether the relationship between these variables and the severity of depression was mediated by cognitive distortion scores, according to Baron and Kenny's suggestions[29]. The Sobel test was used to evaluate the direct and indirect effects of the mediators. Statistical significance was set at a p value of < 0.05.

Results

Descriptive Statistics

A total of 342 female psychiatric outpatients aged 18 and older (mean age = 35.71 years, $SD = 10.17$, range = 18 – 65) were recruited for the study. Almost two thirds of the participants (n = 216, 63.2%) were married, and 21.9% of them (n = 75) were single. Over one third of the participants (n = 132, 38.6%) were at least university / college graduates.

The mean scores and standard deviations of the total score and the scores of the subscales of the DSQ, and the mean total score and standard deviation of the CDS and the IDS-C_{30} used in the current study are presented in Table 1.

Table 1
Means, Standard Deviations, and the Ranges of the Measures

Variables	Mean	SD	Range
IDS-C_{30} Total Score	12.22	11.84	2-38
CDS Total Score	74.42	29.78	1-179
DSQ-MD Score	43.90	11.33	8-78
DSQ-ID Score	98.00	26.75	32-245
DSQ-ND Score	43.52	12.24	10-151

Note: IDS-C_{30}, 30-item Inventory of Depressive Symptomatology - Clinician Version; CDS, Cognitive Distortion Scales; DSQ, Defense Style Questionnaire; MD, Subscale of Mature Defense Style; IDS, Subscale of Immature Defense Style; NDS, Subscale of Neurotic Defense Style.

Correlations among the variables in the study

Consistent with the expectations, as presented in Table 2, depressive symptoms were positively correlated with the total cognitive distortion score, the immature defense style, and the neurotic defense style scores, but they were negatively correlated with the mature defense style scores. Also, the total cognitive distortion scores were positively correlated with the immature, and the neurotic defense style scores, and yet they were negatively correlated with the mature defense style scores. Moreover, the immature defense style scores were positively correlated with the neurotic defense style scores. There was also positive correlation between the mature and the neurotic defense style scores, which was not consistent with expectations.

Table 2
Correlation Matrix of the Variables Used in the Study

	2	3	4	5
1 IDS-C_{30}	0.59**	-0.15**	0.20**	0.18**
2 CDS		-0.27**	0.41**	0.24**
3 DSQ-MD			-0.04	0.25**
4 DSQ-ID				0.25**
5 DSQ-ND				

* $p < 0.05$, ** $p < 0.001$. (1) IDS-C_{30}, Inventory of Depressive Symptomatology -Clinician Version; (2) CDS, Cognitive Distortion Scales; (3) DSQ, Defense Style Questionnaire; (4) MD, Subscale of Mature Defense Style; (5) ID, Subscale of Immature Defense Style; (6) ND, Subscale of Neurotic Defense Style.

Results of the mediated regression analyses

For the first analysis, the mature defense style was entered first followed by the mediator variable at Step 2. The results of the regression analysis revealed that the mature defense style entered in the first step accounted for 2% of the variance in depression, which was significant (F chance [1,340] = 7.40, $p < 0.001$). The variables in the second step explained 35% of the variance (F chance [1,339] = 171.59, $p < 0.001$). Although at the first step the standardized coefficient of the mature defense style was significant (Beta = -0.146, $p < 0.01$), at the second step the effect of the mature defense style on the depression severity minimized upon the addition of the cognitive distortions to the regression, and it was no longer significant (Beta = 0.016). To test the whether the mediator carried an influence of the mature defense style to depression, the Sobel test was conducted. The result of the Sobel test was significant (z = -4.86, $p < 0.001$), and showed that there was a mediation effect, and a reduction in the main effect (total effect = -0.146) by the mediated effect (indirect effect = -0.162, direct effect = 0.016). In other words, the direct relationship between the mature defense style to depression was less than the relationship between the mature defense style, cognitive distortions, and cognitive distortions and depression. Figure 1 presents the mediated relationship between the mature defense style, cognitive distortions and depression.

For the second analysis, the neurotic defense style was entered first followed by the mediator variable at Step 2. The results of the regression analysis revealed that the neurotic defense style entered in the first step accounted for 3% of the variance in depression, which was significant (F chance [1,340] = 11.30, $p < 0.001$). The variables in the second step, explained 35% of the variance (F chance [1,339] = 166.92, $p < 0.001$). Although at the first step the standardized coefficient of the neurotic defense style was significant (Beta = 0.179, $p < 0.01$), at the second step the effect of the neurotic defense style on the depression minimized upon the addition of the cognitive distortions to the regression, and it was

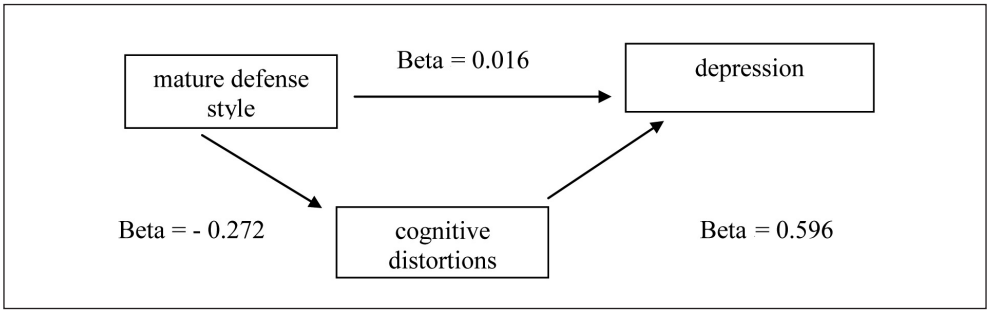

Figure 1. Mediated relationship between the mature defense style scores, cognitive distortions and depression.

no longer significant (Beta = 0.041). To test the whether the mediator carried the influence of the neurotic defense style to depression, the Sobel test was conducted. The result of the Sobel test was significant (z = 4.27, $p < 0.001$), and showed that there was a mediation effect, and a reduction in the main effect (total effect = -0.146) by the mediated effect (indirect effect = 0.139, direct effect = 0.041). In other words, the direct relation between the neurotic defense style to depression was less than the relationship between the neurotic defense style, cognitive distortions, and cognitive distortions and depression. Figure 2 presents the mediated relationship between the neurotic defense style, cognitive distortions and depression.

For the third analysis, the immature defense style was entered first followed by the mediator variable at Step 2. The results of the regression analysis revealed that the immature defense style entered in the first step accounted for 4% of the variance in depression, which was significant (F chance [1,340] = 13.71, $p < 0.001$). The variables in the second step, explained 35% of the variance (F chance [1,339] = 164.06, $p < 0.001$). Although at the first step the standardized coefficient of the immature defense style was significant (Beta = 0.197, $p < 0.001$), at the second step the effect of the immature defense style on the depression minimized upon the addition of the cognitive distortions to the regression, and it was no longer significant (Beta = -0.053). To test the whether the mediator carried the influence of the immature defense style to depression, the Sobel test was conducted. The result of the Sobel test was significant (z = 6.93, $p < 0.001$), and showed that there was a mediation effect, and a reduction in the main

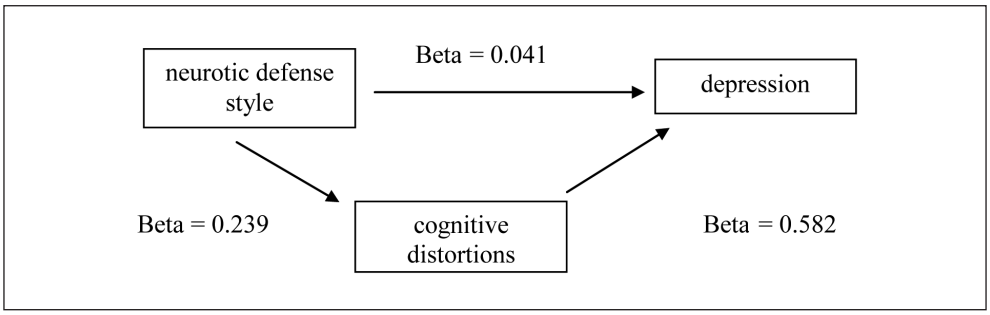

Figure 2. Mediated relationship between the neurotic defense style scores, cognitive distortions and depression.

effect (total effect = 0.197) by the mediated effect (indirect effect = 0.250, direct effect = -0.053). In other words, the direct relationship between the immature defense style to depression was less than the relationship between the immature defense style, cognitive distortions, and cognitive distortions and depression. Figure 3 presents the mediated relationship between the immature defense style, cognitive distortions and depression.

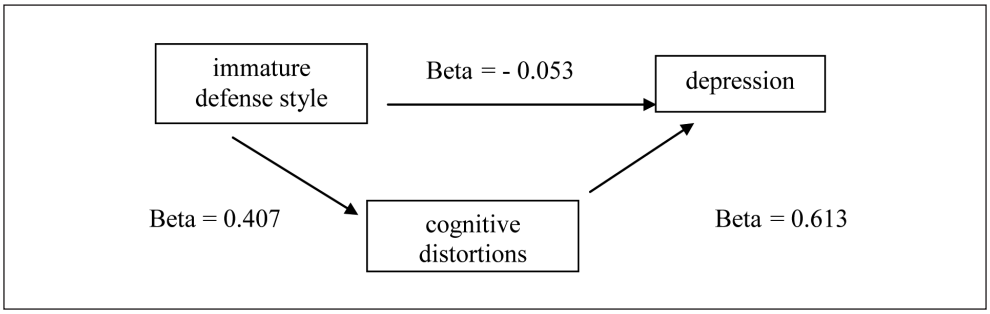

Figure 3. Mediated relationship between the immature defense style scores, cognitive distortions and depression.

Discussion and conclusion

The current study aimed to investigate the mediating role of cognitive distortions on the relationship between defense mechanisms and depressive severity. The findings have revealed that defense mechanisms activate cognitive distortions, which in turn intensify the severity of depression. These results have confirmed our hypothesis.

Cognitive distortions and defense mechanisms were both correlated with the severity of depression, but the correlations were stronger for the former than the latter. This may be due to the fact that cognitive distortions operate on a conscious level, and therefore may be more easily identified, and as a result be endorsed more frequently by the participants. While some authors argue that the assessment of defense mechanisms through questionnaires may not be the ideal way[15], the DSQ has been used in many studies[31-34]. The present study is the first study, to the best of our knowledge, to evaluate the correlation between defense mechanisms and cognitive distortions. There was a positive moderate correlation between these two constructs, and this may provide some support for the integration of cognitive and psychodynamic therapies. Psychodynamic theory's defense mechanisms may be conceptualized as the counterpart of coping mechanisms in cognitive theory. The intertwined relationship between coping mechanisms and cognitive distortions, according to the theoretical background[35,36], may also be reflected by this moderate, positive correlation coefficient. The current study also highlighted the correlation between immature defense styles and cognitive distortions. The strongest correlation was between the immature defense mechanisms and cognitive distortions, suggesting a direct relationship between these two seemingly separate psychological constructs, in which the more immature defense styles are present, so are the more negatively biased interpretations of a patient. The same conclusion may also be valid for the opposite situation. Thus, if a patient presents with mature defense sty-

les, the less frequent cognitive distortions he / she endorses. Results of the correlation analyses have sustained our hypotheses.

Integration of psychotherapeutic approaches needs to be supported by empirical research. Although there is growing interest in the research community to come forward with conclusions about the mechanisms which may be the common ground between different orientations[2], to the best of our knowledge, none have so far focused on the relationship between the essential features of distinct therapeutic approaches. Therefore, a mediation analysis for the severity of depressive symptomatology might exhibit some evidence, to some extent, in favor of the underlying mechanisms for psychotherapy integration. Our results have consistently shown that defense mechanisms do not directly affect the severity of depression, but rather through cognitive distortions, and this finding might provide insight for subsequent studies looking into similar hypotheses.

The current study is one of the few of its kind, and to some extent has demonstrated that unconscious processes may exert their effects on the severity of depression via more consciously detected ones. We hope that these results might provoke further scientific interest in the area of identifying mechanisms underlying the theory of psychotherapy integration.

The present study has some limitations to be taken into consideration. First, the study was undertaken in a very specific population, i.e. women presenting to psychiatry outpatient clinics, and therefore the results may not be suitable to generalize for other populations. Second, the population in the study consisted of patients with a relatively low mean score of depressive severity, and this may also limit the generalizability of the findings. Third, the debate about the questionnaires used for implicit or unconscious processes might be a reason to question the reliability of the participants' responses. Fourth, investigating the relationship between two different orientations warrants more detailed evaluations specific to different orientations, e.g. more questionnaires. Also a cross-sectional evaluation may not be the ideal assessment technique to draw firm conclusions about theoretical underpinnings.

Despite its limitations, the findings of the study are suggestive of the mediating effect of cognitive distortions between defense mechanisms and the severity of depression. Further studies are needed to replicate these findings, and provide support for the underlying theory of psychotherapy integration.

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None.

Author contributions

SB undertook the project as the main researcher. SB and ÖYA drafted the manuscript. SB and SK diagnosed, and recruited the patients. SB and ÖYA undertook the statistical analyses. MHT critically read, and revised the draft. All of the authors contributed to the interpreting of the findings, the revision of the manuscript, and read and approved the final manuscript.

Disclosure of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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