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Comparison of Pharmacological Treatment with Psychotherapeutic Interventions on Borderline Personality Disorder

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ABSTRACT

Borderline personality disorder (BPD) is a mental health condition. People with BPD have extreme mood swings, unstable relationships and trouble controlling their emotions. They also have a higher risk of suicide and self-destructive behavior. Talk therapy is the main treatment for BPD. However due to the diverse clinical presentations of borderline personality disorder, various therapeutic approaches, including cognitive-behavioral interventions and pharmacological treatments, have been offered. Therefore, this study aimed to compare pharmacological treatment with psychotherapeutic interventions for borderline personality disorder. In this clinical trial approved by the university's ethics committee, 30 randomly selected male patients were assigned to three groups. After obtaining consent, the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI) were administered as pre-test measures. The first group received drug therapy (olanzapine), while the second group underwent eight 90-minute sessions of cognitive-behavioral therapy. The control group received no interventions. The data were analyzed using SPSS version 22 software. Significant differences were found between the intervention groups and the control group; both interventions had a significant positive effect on the anxiety and depression of patients with borderline personality disorder, and the therapeutic effects were sustained in the follow-up stage ($p < 0.05$). Additionally, the follow-up results indicated that the effectiveness of cognitive-behavioral therapy on anxiety and depression was greater than that of drug therapy. Cognitive-behavioral therapy can effectively control anxiety and depression in patients with borderline personality disorder.

1. Introduction

Personality disorders (PDs) are characterized by long-term patterns of noticeable disturbance in various domains of functioning, including disturbances in cognition (such as perceptual abnormalities, self-experience disturbances), affectivity (such as excessive intensity or reactivity), interpersonal functioning (e.g., social withdrawal, conflicted relationships), and impulse control (e.g., engaging in recurrent risky or criminal behaviors). The DSM-IV-TR officially recognizes 10 personality disorders, classified into three clusters based on prominent shared features: Cluster A refers to "odd, eccentric" personality disorders (schizotypal, schizoid, paranoid), Cluster B includes "dramatic, erratic, and emotional" disorders (histrionic, narcissistic, borderline, antisocial), and Cluster C denotes "anxious or fearful" disorders (avoidant, dependent, obsessive-compulsive) (Skodol et al., 2005).

Borderline personality disorder is a complex syndrome characterized by central features of mood instability, impulse dysregulation, and interpersonal disruptions. It is the most prevalent personality disorder reported across all cultures worldwide. BPD affects 2.0 to 8.1% of the general population. Higher prevalence is found among psychiatric patients, with estimated rates of 8 to 11% in outpatient and 14 to 20% in inpatient settings. This disorder is a chronic psychiatric condition that may require medical care. Although the cause of borderline personality is not yet fully understood, most patients experience improvement over time (Linda et al., 1999).

While the problems of borderline patients are likely diverse, they can be categorized into four groups: emotional, cognitive, interpersonal, and behavioral. In the cognitive model, primary importance is placed on the individual's beliefs and assumptions, considered as factors in perception and interpretation of events, and shaping emotional and behavioral responses. The cognitive therapy model is based on the assumption that prominent cognitive structures are hierarchically organized and systematically constructed (Linda et al., 1999).

While borderline personality disorder is often perceived by clinicians as one of the most challenging disorders to treat, significant advances have been made in its treatment. Systematic reviews indicate that psychotherapy is the preferred method for treating borderline personality disorder.

Cognitive-behavioral therapy (CBT) is highly suitable for addressing the diverse and often long-term problems faced by individuals with borderline personality disorder for various reasons. From a cognitive-behavioral standpoint, mental disorders are preserved with a combination of distorted beliefs about self and others, environmental factors that reinforce problematic behavior and/or weaken effective behavior, and deficient skills that hinder adaptive responses (Zanarini et al., 2007). The treatment trajectory in cognitive therapy is a subject of research to find the shortest and best timing for treating disorders such as depression, anxiety, and borderline personality disorder (Akbari, 2008).

Cognitive-behavioral therapy is highly suitable for addressing the diverse and often long-term problems faced by individuals with borderline personality disorder for various reasons. From a cognitive-behavioral perspective, personality disorders are maintained with a combination of distorted beliefs about self and others, environmental factors that reinforce problematic behavior and/or weaken effective behavior, and deficient skills that hinder adaptive responses (Beck et al., 2004). CBT encompasses a wide spectrum of techniques to modify these factors, including cognitive restructuring, behavior modification, exposure, mental rehearsal, and skills training. Moreover, CBT emphasizes the importance of a well-defined, supportive, and collaborative therapeutic relationship for individuals with personality disorders, which increases patients' readiness for change and acts as a strong potential source of action.

Due to the clinical heterogeneity of this disorder, various treatment modalities including psychotherapeutic interventions, pharmacotherapy, and their combination have been provided. The pharmacotherapy of personality disorders is a complex issue. Although a wide range of psychotropic medications are prescribed by psychiatrists for this disorder, the Food and Drug Administration (FDA) has not approved any medication specifically for personality disorders. Individuals with personality disorders often have another psychiatric disorder such as depression and substance abuse, which should be appropriately treated with medication. Antipsychotic drugs such as olanzapine may also be effective in reducing impulsive behaviors, cognitive distortions, dissociative states, and treating mood instability and aggression.

Mental health services have inadequately addressed the needs of individuals with borderline personality disorder, as these individuals increasingly receive mental health services as they continue to require them. Most studies conducted for treating these patients are single-case studies, and there is limited research comparing pharmacological treatment with psychological interventions. Therefore, this study aims to compare pharmacological treatment with psychological interventions for borderline personality disorder.

1. Research Method

This study was a randomized controlled clinical trial with pre- and post-test assessments. The statistical population of the study consisted of men with borderline personality disorder who sought treatment at the psychiatric hospitals in Tehran in the year 1402. The sample included 30 men diagnosed with borderline personality disorder who were selected through convenience sampling.
The inclusion criteria were:
1) Having diagnostic criteria for borderline personality disorder based on the DSM-5 in the evaluation by a psychiatrist and in a clinical interview structured for personality disorders based on the DSM-5 during the assessment.
2) Age range between 25-35.
3) Absence of drug poisoning and inhibitory medical problems.
The exclusion criteria were:
1) Lack of willingness to continue treatment.
2) Absence for more than two sessions during the intervention.
The selected patients were randomly assigned to three groups of 10 people each: the first group received drug therapy, the second group received cognitive-behavioral therapy, and the third group served as the control group without any intervention during the study. Each participant underwent anxiety and depression assessments using standardized tests before the interventions began.

2.1 Research tools

2.1.1 Millon Clinical Multiaxial Inventory (MCMI-III):

The Millon Clinical Multiaxial Inventory consists of 175 true-false questions and includes three validity scales, ten clinical personality pattern scales, three severe personality pathological scales, six clinical syndromes scales, and three severe syndromes scales. Moderate convergence has been demonstrated between two types of interviews with the Millon questionnaire. Other sources have reported the sensitivity of the scales from 50% to 79% and negative predictive power from 91% to 98%, with an overall diagnostic accuracy range of 88% to 99%.

2.1.2 Beck Anxiety Inventory (BAI):

This self-report questionnaire, developed in 1988 by Beck and colleagues, consists of 21 questions to measure overall anxiety severity. Participants rate the intensity of each symptom using a four-point scale from "not at all" to "severely, I can't bear it." Scoring involves summing the scores of the 21 questions. Friedrich et al. (1992) reported a reliability coefficient of 0.67 and a Cronbach's alpha of 0.94 for 40 inpatients.

2.1.3 Beck Depression Inventory (BDI):

This questionnaire was developed in 1996 by Beck and colleagues. It consists of 21 questions that measure depressive symptoms on a 4-point Likert scale from 0 to 63. The scoring categorizes scores as follows: less than 10 indicating no depression, 10 to 18 indicating mild to moderate depression, 19 to 29 indicating moderate to severe depression, and 30 to 63 indicating severe depression. Concurrent validity with clinical ratings for psychiatric patients indicates moderate to high correlation coefficients. Beck (1979) reported general validity coefficients from 0.31 to 0.68 and overall validity coefficients using Spearman-Brown reliability of 0.93.

2.2 Execution Methods

1) Pharmacological Treatment:

In the pharmacological treatment group, patients were prescribed 5 to 10 milligrams of Olanzapine three times a day by a psychiatrist, and medication compliance was monitored by the respective caregiver. The control group did not receive any treatment until after the pretest.

2) Behavioral Treatment:

For the cognitive-behavioral group, an 8-session, 90-minute group therapy was conducted. This study utilized Beck's cognitive therapy and schema-focused therapy model. The sessions were based on the guidelines of Young et al. (2021), as cited in Hamidpour and Andouz. This guideline has been validated by its creators (Montazeri et al., 2013). The guideline by Young and colleagues has been translated by Hamidpour and Andouz.

Table 1- The content of the sessions of schema therapy

Sessions	Content
First	Establishing communication, introducing patients, stating group rules (including confidentiality, respect, listening, etc.), identifying the current issues of the members (emotional regulation), assessing 1 patients for "schema therapy" focusing on their life history was done.
Second	Training on schemas and coping styles, linking current problems and emotional regulation with schemas by providing examples. In this session, identification of core beliefs and future thoughts was also done using self-assessment questionnaires and recalling previous memories and experiences
Third	Presenting cognitive strategies such as presenting cognitive art techniques, implementing schema validity tests with examples, introducing a new definition of supportive evidence for 3 schemas.
Fourth	Continuing the presentation of cognitive strategies such as evaluating the pros and cons of coping styles, establishing a dialogue between the healthy aspect and the schema aspect, challenging 4 schemas, teaching the development of instructional cards regarding emotional regulation.
Fifth	Experimental cognitive logic (combating schemas at an emotional and emotional level), mental imagery, linking past mental images to the present, conducting 5 imaginary conversations was presented.
Sixth	Behavioral cognitive logic, stating the purpose of behavioral techniques, ways to prepare a behavioral list, prioritizing and identifying the most problematic behavior, increasing motivation 6 for behavior change aimed at modifying emotional regulation was presented.
Seventh	Behavioral techniques, increasing motivation for behavior change, practicing healthy behaviors through visualization and role-playing, overcoming barriers to change, and making significant changes in life 7 aimed at modifying emotional regulation was implemented. In this session, correcting core thoughts and beliefs was also done along with behavioral techniques.
Eighth	Review and summarization of previous sessions, summarizing and discussing the consequences of inadequate emotional regulation and emotional regulation, determining the timing of relevant post-tests 8 (one week after the last session), and thanking the group, concluding the sessions.

At the end of the research period, the subjects were re-evaluated through questionnaires.

To describe the data, measures of central tendency and dispersion, such as mean and standard deviation, were used. For data analysis, repeated measures analysis of variance and the Tukey and Bonferroni post hoc tests were employed. In order to evaluate the inferential assumptions of the tests, Levene's test (for homogeneity of variances), Kolmogorov-Smirnov test (for normal distribution of data), Mauchly's test and Box's test of sphericity were utilized. The statistical analyses were carried out using SPSS version 22. The significance level for the tests was set at 0.05.

2.3 Findings

The distribution of patients based on the duration of illness indicated that 18 individuals (60%) had experienced the illness for less than 3 years. 7 individuals (23.3%) had been ill for 4 to 7 years, and 5 individuals (16.7%) had a history of illness of more than 10 years. The majority of the patients, 21 individuals (70%), were single, while 9 individuals (30%) were married. The data showed that 10 individuals (33.3%) of the research participants were in the age range of 20-30 years, 18 individuals (60%) were aged 31-40, and 2 individuals (6.7%) were between 41-50 years old. In terms of education, 5 patients (16.7%) had a high school diploma, 15 patients (50%) had a bachelor's degree, and 10 patients (33.3%) had a master's degree. The groups' homogeneity was demonstrated by the K-Square test. According to the results of the K-Square test, there was no significant difference in age and educational level between the two study groups at a 5% probability level (Table 2).

Table 2- Frequency percentage of demographic variables

Demographic Variables		Frequency Percentage
Age	20-30 years	33.3
	31-40 years	60
	50 - 41 years	6.7
Education	High school diploma	16.7
	Bachelor's degree	50
	Master's degree	33.3
	Doctorate	0
Illness history	Less than 3 years	60
	4 to 7 years	23.3
	More than 10 years	16.67
Marital Status	Single	70
	Married	30

The descriptive statistics (mean and standard deviation) of anxiety and depression scores in the experimental and control groups at pre-test, post-test, and follow-up stages are presented in Table 3.

Table 3- Summary of statistical indices related to the scores of three groups in the scales of anxiety and depression

Variable	Groups	Pre-test	Post-test	Follow-up
Anxiety	Cognitive-behavioral	37.81±7.10	18.71±2.43	10.32±1.14
	Pharmaceutical	34.11±5.41	29.45±5.12	18.71±2.43
	Control	33.81±7.22	32.74±8.24	32.00±6.45
Depression	Cognitive-behavioral	32.14±5.28	12.43±3.15	9.27±1.18
	Pharmaceutical	31.11±8.04	21.18±4.05	14.45±1.15
	Control	32.42±7.10	31.98±5.47	32.13±6.52

The information in Table 3 indicates a reduction in the average scores of the intervention groups compared to the control group in the anxiety variable at the post-test and follow-up stages. To determine the significance of the observed changes, repeated measures analysis of variance was used.

Before applying the repeated measures analysis of variance, the assumptions of this test were reviewed. The results of Mauchly's test indicated that the obtained p-value is greater than 0.05, and the score distribution is normal ($p>0.05$). The results of the Box's M test showed that the assumption is established considering the level of significance ($p>0.05$). The results of Levene's test also indicated that the assumption of homogeneity of variances of the research variables in the pre-test, post-test, and follow-up stages is well satisfied ($p>0.05$).

However, the result of Mauchly's sphericity test indicated a violation of this assumption, and the structure of the variance-covariance matrix was not confirmed ($p<0.05$, $\chi^2=272.0$, $p<0.05$ and $\epsilon<0.75$). Therefore, the modified Greenhouse-Geisser correction was applied, and by considering the Greenhouse-Geisser

correction (ε=0.579), the repeated measures analysis of variance was calculated to investigate the difference in the research sample at the three stages of pre-test, post-test, and follow-up.
Subsequently, a four-way analysis of variance was conducted to examine the difference between the intervention and control groups. The results are presented in Table 4.

Table 4 - The results of the analysis of variance test to examine the overall difference between groups for within-group effects and interaction (Wilks' lambda)

Variable	Factor	Value	F-Value	P-value	Eta Squared
Anxiety	Time	0.08	220.22	0.001	0.804
	Time × Group	0.13	35.25	0.001	0.605
Depression	Time	0.10	302.21	0.001	0.906
	Time × Group	0.28	37.41	0.001	0.700

The results in Table 4 indicate that the anxiety and depression variable scores differ significantly across the three time points (pre-test, post-test, and follow-up) ($p<0.05$). Additionally, significant differences were observed between the factor scores (pre-test, post-test, and follow-up) and the groups in the anxiety and depression variables ($p<0.05$).
In the next stage, the differences in the anxiety and depression variables were evaluated between the intervention and control groups, which are presented in Table 5.

Table 5- The results of the analysis of variance test to examine the difference between groups in the variables of depression and anxiety were as follows:

Variable		Degree of Freedom	Mean Squares	F-Value	P-value	Eta Squared
Anxiety	Time	1.15	8041.17	402.61	0.001	0.892
	Time × Group	2.31	2345.20	118.04	0.001	0.825
	Error	55.51	19.95	-	-	-
	Group	2	3681.376	16.621	0.001	0.412
Depression	Time	1.15	9024.14	421.45	0.001	0.971
	Time × Group	2.31	3021.41	124.12	0.001	0.912
	Error	55.51	21.45	-	-	-
	Group	2	3141.321	18.74	0.001	0.516

The results presented in Table 5 indicate that the main effects of cognitive-behavioral therapy and pharmacotherapy on the sample groups overall show a significant difference in the scores of Beck's anxiety and depression ($p<0.05$). In other words, therapeutic interventions significantly contributed to reducing the scores of the anxiety and depression variables in the intervention groups compared to the control group.
For the comparison of the 2×2 tests, the Bonferroni post-hoc test was used (Table 6).

Table 6- The results of the Bonferroni test for pairwise comparison within groups for anxiety and depression were as follows:

Variable	Group	Phase	Mean Difference	Standard Error	P-value
Anxiety	Cognitive Behavioral Therapy (CBT) group vs. Control group	Pretest	+0.94	2.28	0.38
		Post-test	-13.12	2.17	0.017
		Follow-up	-12.98	2.09	0.026
	Pharmaceutical group vs. Control	Pretest	+3.65	2.28	0.1
		Post-test	-27.70	2.17	0.001

	group	Follow-up	-26.81	2.09	0.001
Depression	Cognitive Behavioral Therapy (CBT) group vs. Control group	Pretest	+2.77	2.18	0.091
		Post-test	-13.61	2.16	0.027
		Follow-up	-12.97	2.41	0.025
	Pharmaceutical group vs. Control group	Pretest	+2.8	2.18	0.79
		Post-test	-14.43	2.16	0.001
		Follow-up	-12.31	2.41	0.001

The results of the Bonferroni test indicate that the mean differences between the "Cognitive Behavioral" group and the control group in the pre-test, the pharmacotherapy group and the control group in the pre-test, and the "pharmacotherapy" group with the "cognitive behavioral therapy" group in the pre-test were not significant, indicating that at this stage, there was no significant difference between the cognitive-behavioral therapy group and the pharmacotherapy group compared to the control group ($p>0.05$).
As seen in Table 6, the difference in the mean scores of anxiety and depression in the cognitive behavioral therapy group relative to the pharmacotherapy group in the post-test and follow-up was significant, with a further decreasing trend. Therefore, it can be said that the anxiety and depression scores decreased more in the pharmacotherapy group compared to the cognitive-behavioral therapy group.

2. Discussion

The results showed that the level of anxiety in a group of patients with borderline personality disorder who received cognitive-behavioral therapy significantly decreased more than the pharmacotherapy group ($p=0.001$). The effectiveness of cognitive-behavioral interventions in controlling anxiety symptoms in patients with borderline personality disorders is consistent with the studies of Davidson et al. (2007), Leib et al. (2004), and Gunderson & Gandel (2000).
The current study investigated the effects of cognitive-behavioral techniques and pharmacotherapy in improving depressive symptoms in individuals with borderline personality disorder. The results indicated that cognitive-behavioral techniques in the post-test phase led to a reduction in depression in these individuals, which is somewhat consistent with the findings of the study by Fatehi Zadeh and colleagues. These researchers demonstrated that the use of behavioral therapy leads to a reduction in depressive symptoms in individuals with personality disorders.
In a study on the use of pharmacotherapy in these patients, it was shown that the use of lithium reduces anger and depression in patients. There is evidence for the use of psychotropic medications that affect mood, anger, and impulsivity in patients with borderline personality disorder, mediated by serotonin uptake inhibitors or mood stabilizers. In conclusion, cognitive-behavioral therapy can effectively be used for borderline patients. What is most noticeable in this study is that cognitive-behavioral therapy is a good example of a treatment program for addressing symptoms of borderline personality, and according to these results, it is suggested that cognitive-behavioral techniques be used to control depressive symptoms and anxiety in such patients.
Among the limitations of this study that may affect the generalizability of the results, it can be noted that initially, the difficult access to individuals with borderline personality disorder and other criteria mentioned in the study, as well as the limited sample size, the presence of female participants in the research sample, and the possibility of participants not being consistent in long-term treatment twice a week over a year, and also the potential for attrition of sample individuals over time.

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