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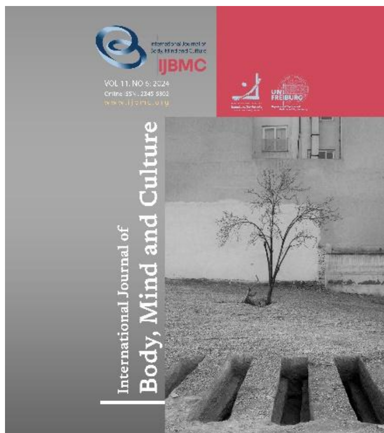
# The Effectiveness of Dialectical Behavioral Therapy on Cognitive Flexibility, Impulsivity, and Social Adjustment on Depressive Patients with Attempted Suicide

Mohammadnabi. Salehi[1*], Kioumars. Beshlideh[2]

1 Ph.D. in Clinical Psychology, Psychosocial Injuries Research Center, Ilam University of Medical Sciences, Ilam, Iran.
2 Professor, Department of Psychology, Shahid Chamran University, Ahvaz, Iran.

Corresponding author email address:
Mn.Salehi66@yahoo.com



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## ABSTRACT

**Objective:** Depression is a disability factor all over the universe, which significantly increases the global burden of the disease. More than 350 million people in the world suffer from depression, among which one of the significant consequences is the increased suicide rates and attempted suicide. This research aims to investigate the effectiveness of Dialectical Behavioral Therapy on cognitive flexibility, impulsivity, and social adjustment in depressive patients with attempted suicide.

**Methods and Materials:** The research design was semi-experimental, with experiment and control groups and pre-test and post-tests. The statistical population of this research included all depressive patients with attempted suicide in Ilam during 2019; among them, 30 people were chosen in terms of simple random sampling and assigned into experimental and control groups. The research instrument includes the Cognitive Flexibility Scale (Dennis & Vanderwal, 2010), Impulsivity (Barrat, 1994), Social Adjustment (Bell, 1961), and Dialectical Behavioral Therapy Package (Linehan, 1993). Multivariate analysis of covariance (MANCOVA) and non-variable analysis (ANCOVA) were used to analyze the data. The analyses were performed using 26 versions of SPSS 26 software.

**Findings:** The results indicated that Dialectical Behavioral Therapy was effective in cognitive flexibility (F=265.441, P<0.000), impulsivity (F=484.471, P<0.000), and social adjustment (F=1065.787, P<0.000) in depressive patients with attempted suicide

**Conclusion:** Based on the results of this study, dialectical behavioral therapy is helpful to treat depression disorders and intervene in critical situations such as attempted suicide.

**Keywords:** Cognitive Flexibility, Impulsivity, Social Adjustment, Depression, attempted suicide.

## Introduction

Mental disorders per year impact one in four adults. Depression is meantime the main disability factor all over the universe, which increases significantly the global burden of the disease (Bakhtiyarovich et al., 2023; Molavi et al., 2018; Sauletzhanovna et al., 2024; Yoon et al., 2018). More than 350 million people in the world suffer from depression, among which one of the significant consequences is increased suicide rates and attempted suicide (Salehi et al., 2019; Valitabar & Hossein Sabet, 2017). Attempted suicide is defined as a self-destructive action that is conducted consciously and sometimes intently with the killing aim but does not lead to one's

death (Wang et al., 2017). Each year, one million people lose their lives to suicide. While 10 to 20 times more than this number (twenty million) suicide attempts occur (Grazioli et al., 2018; Salehi et al., 2019). Based on the results of the research, the suicide rate all over the world has increased by 60%, particularly in developing countries. Likewise, although less than in Western countries, the suicide rate in Iran is higher than in the other Middle Eastern countries. Also meanwhile, Ilam province has a much higher rate than Iran and universal statistics. The suicide rate leads to the death of 16 people per 100,000 in the world, in Iran 4.5 and, of course, in Ilam province, 71.9 (Ghanbari et al., 2016; Roohafza et al., 2014; Salehi et al., 2020).

One of the features of depressed patients who attempt suicide is the lack of cognitive flexibility. The results of the research have confirmed the relevance between cognitive flexibility, depression, and suicide attempts (Aghaei et al., 2019). Cognitive flexibility is the individual's degree of evaluation of the controllability of circumstances, which varies in different situations. Moreover, people can identify behaviors as being best replaced in a social position. The ability to change cognitive triggers to adapt to altering environmental stimuli is a crucial component in the definitions of cognitive flexibility (Curran, 2018). Inflexibility and intolerance to the troubles lead depressive patients to find their condition frustrating without any change. Therefore, the consequence of this way is the thought that suicide permeates these people's minds as the mere solution (Aghajani et al., 2022; Pourjaberi et al., 2023; Sadri Damirchi et al., 2019).

One of the cases that lead to attempting suicide in depressive disorders is impulsivity and the emergence of impulsive behaviors. The results of the research confirm the relationship between impulsivity, depression, and attempting suicide (Branley-Bell et al., 2019; Costanza et al., 2021). Impulsivity involves behaviors without caution and impetuous responses to the stimulus, almost producing non-compatible consequences. Impulsivity is regarded as one of the main dimensions of attempting suicide in depression disorder (Roman et al., 2021).

Among the other variables that are related to the condition of depressive patients who attempted suicide is social adjustment. The results obtained from the studies have confirmed the relationship between social adjustment, depression, and suicide dangerous factors, as well (Ahmadi & Moeini, 2015; Extremera et al., 2018). Social adjustment can be regarded as the individual adjustment or environmental changes by the person, correspondent to his/her own needs and wills that is a reflection of one's interaction with others, the satisfaction of one's roles, and the way of playing the roles which are likely influenced by the previous person, culture and the family's expectations (Behamin & Kouroshnia, 2017; Serretti et al., 2013). The research evidence indicates that social adjustment is plagued in depressive patients and even in these people; the improvement of social adjustment is dramatically slower than the improvement in depressive symptoms (Antypa et al., 2013).

The complexity of the depression issue and suicide attempt, as well as the irretrievable damage it will cause to the person and society, indicates that applying psychotherapy and preventive methods is essential for depression and suicide attempts (Grazioli et al., 2018). Since a history of suicide attempts increases the likelihood of re-suicide by over 40 times, declining the signs and symptoms of depression and attempting suicide due to its repetitive and recurrent nature requires the use of psychotherapies, which have features and characteristics of depressed patients who attempt suicide such as cognitive flexibility, impulsivity, social adjustment, etc. to be effective for these patients (Salehi et al., 2019). Of the innovations in psychological therapies that pay substantial attention to emotional skills and are mainly designed for self-harming behaviors, impulsivity, emotional regulation, etc., dialectical behavior therapy is highly mentioned.

Dialectical Behavior Therapy (DBT) is among the psychotherapies whose effectiveness in the treatment of mood disorders, self-harming behaviors, and suicide attempts has been confirmed in diverse studies (DeCou et al., 2019; Elsayad & Alghtani, 2022; Katz & Korslund, 2020; Kothgassner et al., 2021; Linehan et al., 2015; Yasfard et al., 2019). This type of psychotherapy was developed in 1993 by Marshal Linehan to treat emotional maladaptation and behavioral problems and to treat individuals' problems with chronic suicide and borderline personality disorder. Four components of interventions are provided in their group therapy method, which comprises distress tolerance skills, mindfulness (components of the acceptance principle), and emotional regulation and interpersonal

relationships (components of the alteration principle) (Mohammadi Lapvandani et al., 2023; Sadeghian-Lemraski et al., 2024; Vardikhan, 2024).

The effect of dialectical behavior therapy on declining the symptoms of depressed patients, people attempting suicide, bipolar disorder, as well as anger, impulsivity, emotional regulation, and social perception in patients with diabetes, heart disease, etc., has been confirmed (Lang et al., 2015). dialectical behavior therapy and its techniques and skills, while increasing individuals' flexibility, can also impact impulsivity and adjustment (Salehi et al., 2019; Salehi et al., 2020).

Hence, regarding the occurrence and prevalence of depressive disorders and suicide attempts and its upward trend in Iran, especially in Ilam, the psychological dimensions and consequences, as well as the use of effective and efficient psychotherapy and their introduction, are of high significance, as being logical and essential to treat depression and prevent suicide, as well. Another point is that the results of this study are applicable in the field of treatment of depressed patients who attempt suicide, for psychologists and counselors to mention techniques and treatment packages as being practical and useful and applied in counseling and psychotherapy centers. Thus, this study was conducted with the aim of the effectiveness of dialectical behavior therapy on cognitive flexibility, impulsivity, and social adjustment of depressed patients who attempted suicide.

## Methods and Materials

### *Study Design and Participants*

The research design was semi-experimental, with experiment and control groups and pre-test and post-test. The statistical population of this research comprised all of the depressed patients who attempted suicide in Ilam in 2018, among whom, by simple random sampling method and through screening interviews and by the inclusion criteria, finally 30 people were chosen as sample members and as they were randomly assigned to dialectical behavior therapy and control groups of which one had 15 members.

It is worth noting that the list of all individuals who attempted suicide from the health network of Ilam City and Shahid Moustafa Khomeini Hospital was provided by the corresponding author (expert on suicide prevention plan) and through screening interviews and based on the criteria for inclusion and exclusion of subjects in this study, which were:

Inclusion criteria research included the diagnosis of one of the depression disorders of the spectrum based on the diagnostic and statistical guide of Mental disorders fifth version (DSM-V) by a psychiatrist and psychologist, the history of suicide, no mental anxiety disorders, non-use of drugs and medicines during the research period and psychotherapy sessions, the satisfaction of the subjects and volunteers for participating in this research, the age of the subjects 20 to 40 years, the reading and writing education. Exclusion criteria research included; the patient suffering from a physical disease (such as cancer) to which depression can be attributed, the presence of seizures and neurological diseases, drug use, mental retardation, and psychotic spectrum disorders.

First, after the initial arrangements, the designated 30 depressed patients who committed suicide to participate in the study room of the Civil Service Training Center (Clinic No. 6) were present. After a general description of the research objectives and the emphasis on ethical principles such as freedom, choice, privacy, and informed consent forms were placed in participants' hands, it was agreed that it was completed and signed. Then, a random sample of members in dialectical behavior therapy and control groups were both pre-tests. The education and health programs related to the experimental group were carried out in groups. At the same time, the control group received no training during the study period. After the training session, the test was taken by both groups.

It is also essential to mention that after the end of this study, the members of the control group received psychotherapy and telephone follow-up services, of course, individually and with regarding the instructions of the suicide re-prevention plan.

### *Data Collection Tools*

**Cognitive Flexibility Scale (CFI)**: The Cognitive Flexibility Scale was developed by Dennis and Vander Wal and is a short 20-item self-report tool. The items in this questionnaire are ranked based on the degree of agreement on a 7-point Likert scale. The Cognitive Flexibility Questionnaire has three subscales of controllability, different options, and behavior justification perceptions. Questions (3-4-7-9-11-17) are

scored reversely. The minimum score obtained from this questionnaire is 20, and the maximum score obtained is 140 (Dennis & Vander Wal, 2010). Dennis and Vander Wal's (2010) Simultaneous validity of this questionnaire with the second edition of the Beck depression questionnaire was -0.39, and its convergent validity with the Martin and Robin Cognitive Flexibility Scale was 0.75. In Iran, Shareh et al., in 2013, the retest validity coefficient of the total scale was 0.71, and the subscales of controllable perception, perception of different options, and perception of behavior justification were 0.72, 0.55, and 0. 57 were reported, respectively. These researchers have reported Cronbach's alpha coefficients of the total scale as 0.90 and for the subscales as 0.89 and 0.55, respectively (Imani et al., 2017).

**Barratt Impulsivity Scale (BIS)**: The Barratt Impact Scale was created by Barrat in 1994. The latest version of this scale has been compiled by Patton, Stanford, and Barratt (1995). This scale measures the multidimensional nature of impulsivity through its 30 items. The subject responds to each item on a four-point scale. Barrat Impulsivity Questionnaire has three subscales: attention or cognitive impulsivity, motor impulsivity, and non-planning. Items (4-5-13-14-15-16-17-19-20-21-26) are scored reversely. The minimum score obtained from this questionnaire is 30, and the maximum score obtained is 120. The higher the score, the more impulsive it is, and vice versa (Moustafa et al., 2017). In a study conducted in Iran for the first time, the validity coefficient was reported to be 0.60, and the internal consistency was 0.72 (Amiri & Yaghoubi, 2016).

**Bell Adaptation Inventory (BAI)**: The Bell Adaptation Inventory was compiled in 1961 by Bell. It contains 160 items with five subscales (social adjustment dimension, emotional adjustment, home adjustment, physical health adjustment), for which there are 32 items. In this research, the social adjustment subscale is used. The subject responds to the items by yes and no. The total validity of this scale is 0.94. Also, its reliability coefficient is 0.88in social adjustment, job adjustment is 0.85, emotional adjustment is 0.91, family adjustment is 0.91, and physical health adjustment is 0.82. In Bahrami's (1992) research, after translating and editing this scale, it was randomly performed on 200 people whose Cronbach's alpha coefficient was equal to 0.89 (Ghasemi & Sharifi, 2018).

*Intervention*

A guide to performing dialectical behavior therapy provided by Marshal Linehan (1993), in which four main components or skills are taught. Two sessions are allocated to teach each of these skills. This treatment protocol is conducted in eight group sessions, one 90-minute weekly session. Also, each session comprises the introduction of purposes and topics related to that session, discussions and exercises inside the session, and exercises out of sessions (Linehan, 1993):

**Fundamental Inclusive Consciousness (First and Second Sessions):** In the initial sessions of DBT, the focus is on developing fundamental mindfulness skills that enhance conscious awareness and acceptance. The core skills introduced include "What skills" (Observe, Describe, and Participate) and "How skills" (Non-judgmental, Comprehensive, and Practical Self-awareness). To build mindfulness, clients practice conscious breathing, focusing for a minute, and focusing on an object to achieve complete present-moment awareness. Mindfulness meditation is taught and practiced, alongside mindfulness training exercises that foster greater self-awareness. Participants are encouraged to practice non-judgmental self-awareness by recording negative judgments and becoming familiar with the labels they use. The goal is to promote mindfulness skills through kindness and compassion. Additionally, clients practice meditation activities that help bring peace and clarity.

**Tolerance of Distress (Third and Fourth Sessions):** The next phase of the therapy addresses distress tolerance, which equips clients with tools to manage emotional crises and challenging situations. This includes skills for crisis passing, such as distracting thoughts, calming down, and focusing on the gains and losses of the situation. Clients learn techniques for reversing attention through counting, redirecting attention from self-damaging behaviors, and self-calming through the use of their five senses. Visualization of a safe place is introduced as a technique for calming down. Participants are also encouraged to prepare a list of pleasurable activities, incorporating them into their weekly schedule as a means of maintaining emotional balance. In addition to these techniques, reality acceptance skills are taught, including pure acceptance and the use of mind-turning strategies.

Clients are encouraged to identify a superior power, increase self-encouragement, and develop a coping plan that incorporates affirmative self-talk, physical activity, and proper sleep hygiene.

**Emotion Regulation (Fifth and Sixth Sessions):** Emotion regulation skills are introduced to help clients identify, understand, and manage their emotions effectively. The goal of this phase is to reduce vulnerability to emotions and increase the frequency of positive emotional events. Clients are taught to recognize and label emotions, fill out exercise sheets to identify their emotional states, and understand how thoughts influence emotions and behaviors. They learn how to address emotions that may lead to risky or harmful behaviors, balancing thoughts and emotions using various exercises and form-filling techniques. Clients are taught mindfulness techniques to acknowledge and deal with their emotions without judgment. A key part of this phase is teaching clients to act in opposition to intense emotional urges, with practical exercises such as planning contrasting actions. A weekly regulation record sheet is used to monitor progress and reduce emotional vulnerability.

**Interpersonal Communication (Seventh and Eighth Sessions):** The final phase of DBT focuses on interpersonal effectiveness, teaching clients the skills necessary to navigate relationships and express their needs assertively. This includes skills for asking for what they need and saying no firmly. Clients practice designing and making simple requests, ensuring they can balance their desires with the needs of others. The intensity of their wants and the art of negotiation are explored, and clients are taught how to assert themselves with confidence. In addition to assertiveness, clients also develop skills for coping with unavoidable interpersonal conflicts or incompatibilities. They are trained in self-knowledge and self-esteem, including exercises such as writing about their rights and identifying their communication style. Barriers to using interpersonal skills are explored, and clients practice strategies for overcoming passivity in relationships, such as shyness. Identifying interpersonal problems and resolving conflicts becomes a core focus, with clients learning to navigate these challenges with improved communication skills.

### *Data analysis*

Multivariate analysis of covariance (MANCOVA) and non-variable analysis (ANCOVA) were used to analyze the data. The analyses were performed using 26 versions of SPSS 26 software. An acceptable significance level was considered to confirm the statistical hypotheses of $p < 0.05$.

## Findings and Results

A total of 30 depressed patients who attempted suicide in Ilam, with an age range of 20 to 39 years, a mean age of 27.9 years, and a standard deviation of 2.11, participated in this study. Among these, 17 people (56.67%) were female, and 13 (43.33%) were male. Based on marital status, 12 people (40%) were single, and 18 (60%) were married, among whom 11 people (36.67%) had a diploma, 14 (46.67%) had a bachelor's degree, and 5 (16.66%) had a master's degree.

**Table 1**

*Mean and standard deviation of cognitive flexibility, impulsivity, social adjustment*

| Variable | Stage | Control Mean | Control Standard Deviation | DBT Mean | DBT Standard Deviation |
|---|---|---|---|---|---|
| Cognitive Flexibility | Pre-test | 58.13 | 5.16 | 59.40 | 4.33 |
| | Post-test | 55.86 | 8.35 | 90.80 | 9.39 |
| Impulsivity | Pre-test | 94.13 | 11.08 | 94.46 | 10.66 |
| | Post-test | 96.26 | 11.79 | 55.56 | 5.45 |
| Social Adjustment | Pre-test | 22.60 | 2.09 | 22.46 | 1.84 |
| | Post-test | 22.93 | 2.31 | 13.13 | 1.87 |

Table 1 indicates the mean and standard deviation of the cognitive flexibility variable, impulsivity, motor, and social adjustment in the pre-test and post-test for both control and experimental groups. Kolmogorov-Smirnov test was used to both examine the hypotheses of covariance analysis and test the hypothesis of normal distribution of variables that obtained significant levels for cognitive flexibility ($P>0.478$), impulsivity ($P>0.900$)

and social adjustment (P>0.114) which are more significant than (P> 0.05); therefore they are not significant, and the distribution of variables is normal. For the assumption of variances homogeneity, the results of Levene's test for cognitive flexibility are equal to (2.910), impulsivity (0.869), and social adjustment (0.309), which are not significant at the level of (P<0.05), so the assumption of variances homogeneity is observed.

Finally, to examine the homogeneity of regression slopes, the F value is related to the group's interaction with the pretest for the variables of cognitive flexibility (1.962), impulsivity (2.090), and social adjustment (2.051), which are not significant at the level of (P <0.05). Hence, the regression slopes are related to homogeneous research variables, and consequently, the homogeneity assumption of regression slopes is observed, too.

**Table 2**

*Results of multivariate covariance analysis (MANCOVA) test for group membership effect*

| Test/ Indicator | Value | F | Degree of freedom of hypotheses | Degree of freedom of error | Significant level | Eta squared |
|---|---|---|---|---|---|---|
| Pillai's Trace | 0.988 | 644.282 | 3.000 | 23.000 | 0.000 | 0.988 |
| Wilks' Lambda | 0.988 | 644.282 | 3.000 | 23.000 | 0.000 | 0.988 |
| Hoteling's Trace | 0.988 | 644.282 | 3.000 | 23.000 | 0.000 | 0.988 |
| The Roy's Largest Root | 0.988 | 644.282 | 3.000 | 23.000 | 0.000 | 0.988 |

Table 2 indicates the results of the multivariate covariance analysis (MANCOVA) test for the effects of group membership in both dialectical behavior therapy and control groups. As the results of this table illustrate, the test of the Pillai's trace (0.988), the value of Wilks' Lambda (0.012), the Hoteling's trace (0.037), and the Roy's largest root (84.037), as well as the amount of F, is equal to (F=644.282). The significance level (p <0.000) is statistically meaningful. In other words, the relationship between the linear combination of dependent variables is significant with the independent variable; that is, there has been an interaction between dialectical behavior therapy and dependent variables (i.e., cognitive flexibility, impulsivity, and social adjustment).

Based on the results of Table 2, the value of Wilks' lambda is equal to (0.012), which is the same as the indeterminacy coefficient. Thus, the effect size is obtained by the difference in Lambda Wilks' value from the unit (1-0.012=0.988). The effect or difference is equal to 0.988. Indeed, 0.98% of individual differences in dependent variable post-test scores are related to dialectical behavior therapy's effect. In other words, the effect of dialectical behavior therapy on cognitive flexibility, impulsivity, and social adjustment of depressed patients attempting suicide together is equal to 0.988, which is a perfect effect size. The statistical power equals 1.00; in other words, the second type of error was impossible.

**Table 3**

*Results of one-way covariance analysis (ANCOVA) test on the mean scores of post-test cognitive flexibility of control group and dialectical behavior therapy group with pre-test control*

| Variable | Source of changes | Squares sum | The degree of freedom | Mean squares | F | Significance level | Effect size |
|---|---|---|---|---|---|---|---|
| Cognitive Flexibility | Pre-test | 1107.504 | 1 | 1107.504 | 34.907 | 0.000 | 0.564 |
| | Group | 8421.658 | 1 | 8421.658 | 256.441 | 0.000 | 0.908 |
| | Error | 856.629 | 27 | 31.727 | | | |

Table 3 indicates the results of the one-way covariance analysis (ANCOVA) test on the mean scores of post-test cognitive flexibility of both control and dialectical behavior therapy groups with pre-test control. As the results of this table show, with pre-test control, there is a statistically significant difference between the depressed patients attempting suicide in both experimental and control groups in terms of cognitive flexibility (F=265.441, P<0.000); in other words, dialectical behavior therapy has increased the level of cognitive flexibility among depressed patients attempting suicide in the experimental group compared

to the control one in the post-test step. Indeed, dialectical behavior therapy in cognitive flexibility has increased the number of depressed patients attempting suicide. The effect of this therapeutic intervention is equal to 0.908, i.e., 0.90% of the differences in the post-test scores of cognitive flexibility are related to the effect of dialectical behavior therapy.

**Table 4**

*Results of one-way covariance analysis (ANCOVA) test on the mean scores of impulsivity post-test in the control group and dialectical behavior therapy group with pre-test control*

| Variable | Source of changes | Squares sum | The degree of freedom | Mean squares | F | Significance level | Effect size |
|---|---|---|---|---|---|---|---|
| Impulsivity | Pre-test | 1667.406 | 1 | 1667.406 | 64.604 | 0.000 | 0.705 |
| | Group | 12504 | 1 | 12504.021 | 484.471 | 0.000 | 0947 |
| | Error | 696.860 | 27 | 25.810 | | | |

Table 4 indicates the results of the one-way covariance analysis (ANCOVA) test on the mean scores of impulsivity post-test in both control and dialectical behavior therapy groups with pre-test control. As the results of this table show, through pretest control, there is a statistically significant difference between the depressed patients attempting suicide in both experimental and control groups in terms of impulsivity rate (F=484.471, P<0.000); in other words, dialectical behavior therapy has decreased the impulsivity rate among depressed patients attempting suicide in experimental group compared to the control one in the post-test step; in fact, dialectical behavior therapy has declined the impulsivity rate among depressed patients attempting suicide in experimental group. The effect of this therapeutic intervention is equal to 0.947, i.e., 0.94% of the differences in the impulsivity post-test scores are relevant to the effect of dialectical behavior therapy.

**Table 5**

*Results of one-way covariance analysis (ANCOVA) test on the mean scores of post-test of social adjustment in the control group and dialectical behavior therapy group with pre-test control*

| Variable | Source of changes | Squares sum | The degree of freedom | Mean squares | F | Significance level | Effect size |
|---|---|---|---|---|---|---|---|
| Social Adjustment | Pre-test | 76.855 | 1 | 76.855 | 116.499 | 0.000 | 0.812 |
| | Group | 703.103 | 1 | 703.103 | 1065.787 | 0.000 | 0.975 |
| | Error | 17.812 | 27 | 0.660 | | | |

Table 5 indicates the results of the one-way analysis of covariance (ANCOVA) test on the mean scores of the post-test of social adjustment in the control group and dialectical behavior therapy group with pre-test control. As the results of this table illustrate, through pre-test control, there is a statistically significant difference between the depressed patients attempting suicide in the experimental and the control groups in terms of social adjustment (F=1065.787, P<0.000); in other words, dialectical behavior therapy increased the rate of social adjustment in depressed patients attempting suicide in experimental group compared to the control one in the post-test step; in fact, dialectical behavior therapy has increased social adjustment among depressed patients attempting suicide in experimental group. The effect rate of this therapeutic intervention is equal to 0.975, i.e., 0.97% of the differences in post-test scores of social adjustment are relevant to the effect of dialectical behavior therapy.

## Discussion and Conclusion

Analysis of the findings of this research indicated that dialectical behavior therapy has a significant effect on cognitive flexibility, impulsivity, and social adjustment in depressed patients attempting suicide and enhances cognitive flexibility and social adjustment. It also declines impulsivity in depressed patients attempting suicide. This research finding is based on the results many previous studies (Akhavan & Sajjadian, 2016; Alavi et al., 2011; Amini & Shariatmadar, 2018; Amirian et al.,

2017; DeCou et al., 2019; Elsayad & Alghtani, 2022; Frazier & Vela, 2014; Katz & Korslund, 2020; Kothgassner et al., 2021; Linehan et al., 2015; Yasfard et al., 2019), in the field of dialectical behavior therapy effectiveness on cognitive flexibility, impulsivity and social adjustment in depressed patients attempting suicide and other clinical populations, as crisis intervention psychotherapy are coexistent and consistent. Explaining the effectiveness of dialectical behavior therapy on increasing cognitive flexibility and social adjustment, as well as reducing the impulsivity of depressed patients attempting suicide, it is stated that based on the results of the research, this treatment is considered for various clinical populations in acute and emergencies (including attempting suicide, severe emotional and emotional disorders, acute and high-risk behaviors) as a first-line (first choice) therapeutic method (Vardikhan, 2024; Yasfard et al., 2019). Generally, dialectical behavior therapy seeks to impact cognitive impairments in such areas as paranoid beliefs, parsing responses (increasing cognitive flexibility), and impairment in terms of using mindfulness, distress tolerance, emotional regulation, and interpersonal skills. Behavioral impairment, such as self-harm and suicide attempt (decreased impulsivity); emotional failures, such as mood problems and anger management (increased emotion control); interpersonal failure; and self-sensation, such as identity and communicative problems (increased social adjustment). Indeed, dialectical behavior therapy targets self-damage and suicidal behaviors in terms of applied techniques and skills (Sadeghian-Lemraski et al., 2024).

Hence, the clients faced harmful behaviors instead of suppressing emotions regarding the traumatic behavior of attempting suicide, life history and the experiences of depressed patients attempting suicide, as well as the researcher's experience of treatment sessions during these sessions. Besides the emotional discharge, they found more rational justifications for traumatic and stressful behaviors through four dialectical behavior therapy skills. Based on the researcher's observations and therapists' feedback, during the dialectical behavioral therapy sessions, the therapists became more emotionally relaxed, and their depressed moods improved as the effects of their harmful and impulsive behaviors diminished. Thus, the effectiveness of dialectical behavior therapy on increasing cognitive flexibility and social adjustment, as well as reducing the impulsivity of depressed patients attempting suicide, is logical and explicable.

The results indicated that dialectical behavior therapy had a significant effect on the cognitive flexibility of depressed patients attempting suicide in the experimental group compared to the control group in the post-test phase. In other words, dialectical behavior therapy has increased the cognitive flexibility of depressed patients attempting suicide.

Explaining the effectiveness of dialectical behavior therapy on increasing cognitive flexibility in depressed patients attempting suicide, it is stated that depressed patients attempting suicide have a catastrophic and intolerable view of their disease and psychological state, which indicates the type of perception (perfectly black) and their negative thought is about life events. Accordingly, the emphasis on fundamental pervasive consciousness (acceptance and mindfulness) as one of the components and axes of dialectical behavior therapy helps clients to apprehend and accept suicide event without any judgment; then, presenting antitheses of the same event which are not perfectly black, makes other cognitions and perceptions (black and white) in the client's mind, which after the end of treatment sessions, the client obtains to a set of positive and negative facts about the disease and attempts suicide (Katz & Korslund, 2020). Finally, obtaining these perceptions and cognitions requires increasing cognitive flexibility in depressed patients who attempt suicide (Nadimi, 2016; Amini & Shariatmadar, 2018). Finally, it is essential to mention that although cognitive flexibility is not one of the main axes of dialectical behavior therapy, learning the four axes of dialectical behavior therapy (i.e., fundamental pervasive awareness, distress tolerance, emotional regulation, effective communication) to get therapeutic purposes whether or not is related to the cognitive flexibility (Shandiz et al., 2021).

The results indicated that dialectical behavior therapy had a significant impact on the impulsivity of depressed patients attempting suicide in the experimental group compared to the control group in the post-test phase. In other words, dialectical behavioral therapy has declined the impulsivity of depressed patients attempting suicide.

Explaining the effectiveness of dialectical behavior therapy on reducing impulsivity in depressed patients attempting suicide, it is stated that the reason for impulsivity reduction in these patients is in the content

of skills and programs of this therapeutic approach. Indeed, dialectical behavior therapy has an integrated therapeutic element and content to reduce impulsivity and prevent suicide attempts among potential populations (more specifically depressed patients) whose ultimate goal is to help these therapists break and overcome the impaired cycle of impulsive behaviors and emotional instability. The depressed patients attempting suicide are increasingly impulsive and, more than anything, are cognitively disturbed by obvious non-regulating negative emotions. Since these people lack rational thinking in stressful situations, and when they try to free themselves from social obligations and compulsions, they can neither have planned nor pre-planned behavior. Also, they cannot pay attention to the consequences of their actions. Therefore, it can be concluded that one of the reasons for the success of dialectical behavior therapy in this field has been to decline the suffering of people involved in emotional problems which dialectical behavior therapy skills have reduced inappropriate emotions such as impulsivity (Amiri & Yaghoubi, 2016; Nadimi, 2016).

The results indicated that dialectical behavior therapy has a significant impact on the social adjustment of depressed patients attempting suicide in the experimental group compared to the control one in the post-test phase. In other words, dialectical behavioral therapy has increased the social adjustment of depressed patients attempting suicide.

Explaining the effectiveness of dialectical behavior therapy on increasing social adjustment in depressed patients attempting suicide, both the action mechanism of dialectical behavior therapy and how it impacts communication problems, is a referral. Dialectical behavior therapy has been conceptualized as a fundamental plan for treating cognitive, behavioral, and emotional problems, primarily aiming to improve self-regulation in social relationships. The specific beliefs and emotions of some individuals involved in communicative issues lead to the interaction of behavioral and cognitive strategies with self-regulation. Various studies have indicated that some thoughts, such as beliefs about the specific meaning of thoughts and the effectiveness of memory and cognitive control, contribute to the emergence of continuous non-adaptive forms of coping with mental and communicative problems. Thus, dialectical behavior therapy aims to alter the individual's view about the usefulness of coping methods with mental and communication issues (Lang et al., 2015; Teimouri et al., 2018).

Likewise, explaining these results, it is mentioned that training effective interpersonal skills in dialectical behavior therapy leads to improved emotional stability, effective interpersonal relationships, and increased social adjustment in depressed patients attempting suicide because these patients require apprehension and acceptance by others due to the feelings of loneliness, rejection, and social isolation. Also, based on the results of research, depressed patients attempting suicide have practical interpersonal skills and less social relationships, so in the field of interpersonal and social relationships, they suffer from isolation, unstable relationships, absurdity, and emptiness states. Hence, training effective interpersonal skills is one of the primary skills in dialectical behavior therapy, which leads to identifying communication styles, fit between one's desires and those of others, determining interpersonal relationships and the given problems of which their modifications will improve their effective interpersonal relationships and enhance social adjustment (Kleiber et al., 2017; Nadimi, 2016).

To sum up, based on the results of this research, dialectical behavior therapy has been effective in cognitive flexibility, impulsivity, and social adjustment of depressed patients attempting suicide. Therefore, this type of treatment is valuable and efficient in treating depressive spectrum disorders and intervention in traumatic conditions such as attempting suicide. Consequently, based on the results of the research and in terms of application, it is suggested that this type of treatment be used in counseling and psychotherapy centers to treat depressive disorders and intervention in acute suicide conditions. Of course, this study, like other studies, had limitations, including a lack of possibility of a follow-up test. Regarding the emergency and the necessity to address the situation of depressed patients attempting suicide and the fact that the control group should also receive counseling and psychotherapy services, there was no possibility of a follow-up test, which can be one of this study’s limitations. Thus, it is suggested that follow-up tests be used in future research to ensure the effects and applications of this type of psychotherapy in the long run.

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## Declaration of Interest

The authors of this article declared no conflict of interest.

## Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

## Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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## Authors' Contributions

All authors equally contributed to this study.

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