

A Comparison of the Effectiveness of Dialectical Behavior Therapy (DBT) and Mindfulness Training in Improving Sleep Quality and Reducing Distress Tolerance in Drug-addicted Treatment Seekers

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Abstract

Introduction: The present study aimed to compare the effectiveness of dialectical behavior therapy and mindfulness training in improving the sleep quality and reducing distress tolerance in drug-addicted treatment seekers.

Methods: The research method was quasi-experimental with pretest-posttest design and control group. Using a convenience sampling method, 120 men who were admitted in the mid-term residential addiction treatment center in Baghmalek city were first selected, and then 80 individuals were randomly assigned to three experimental and one control groups (n=20 per group). Experimental groups received twelve 45-minute sessions of mindfulness training, dialectical behavior therapy, and a combination of mindfulness and dialectical behavior therapy. The control group did not receive any intervention training program. All participants responded to the Pittsburgh Sleep Quality Index (PSQI) and Distress Tolerance Scale (DTS) at the beginning of the study, at the end of intervention and one month after the treatment (one-month follow-up). The multivariate analysis of covariance and one-way analysis of variance were utilized to analyze the data. SPSS software was used for data analysis. A significance level of 0.05 was considered statistically significant.

Results: Dialectical behavior therapy and mindfulness training were effective in reducing distress tolerance ($F=124.33$, $P=0.0001$) and improving sleep quality ($F=37.03$, $P=0.001$). The combination of dialectical behavior therapy and mindfulness training had no significant effect on distress tolerance ($P=0.071$) and sleep quality ($P=0.090$).

Conclusion: Both methods had similar effects on the participants. The follow-up results indicated lasting effects of dialectical behavior therapy and mindfulness training on sleep quality and distress tolerance.

Keywords: Mindfulness, Dialectical Behavior Therapy, Sleep Quality, Distress Tolerance, Drug-addicted.

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Introduction

Substance use disorder (SUD) is a chronic relapsing disorder that is associated with medical, psychiatric, familial, occupational, legal, financial, and spiritual problems. This disorder not only affects the individual life, but also creates a great deal of distress for family and society and imposes a great burden on them. Addiction, like any other chronic disorder, needs to be managed over time (1). The importance of addiction phenomenon has attracted increasing attention worldwide (2); hence, there are many therapeutic processes for the treatment of drug users, but the relapse phenomenon is still noticeable (3).

Sleep is an important element of daily cycle and

a human need. Insomnia is defined as difficulties in falling asleep or staying sleep for at least a month (4). According to the criteria of the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), the main characteristic of insomnia is dissatisfaction with quality and quantity of sleep associated with complaints of difficulty in starting and maintaining sleep. Complaint about inadequate sleep quality, under which a person does not feel relaxed instead of enough long time, is the common complaint about sleep. In addition, persistent sleep disorders (both insomnia and excessive drowsiness) are the risk factors for subsequent mental illness and substance use disorders (5). Sleep quality is a complex

phenomenon that is difficult to be defined and measured. In other words, it cannot be measured in the laboratory environment. Poor sleep quality leads to daily drowsiness, mood changes, and an increased risk of unhealthy behavior (6).

Addicts have emotional regulation disorder and low distress tolerance; hence, it seems that distress tolerance and emotional regulation disorder are the most significant causes of drug addiction and its retention and relapse. Distress tolerance is an individual difference factor that refers to the capacity for distress tolerance and experience (7). Distress tolerance is described as a meta-emotional construct. People with low distress tolerance 1. describe the emotional distress as an unbearable experience, 2. find emotional distress unacceptable, 3. try to relieve a negative emotional state, and 4. are unable to focus their attention on something other than their distress (8). Therefore, reducing the level of distress tolerance may be accompanied by maladaptive responses to stress, including seeking to escape or avoid negative affect (e.g. addiction) (9). Several factors can affect distress tolerance. According to the research conducted on this field, people who had rejecting and controlling parents experienced physical complaints of distress and discomfort as well as neurological complaints in the early adulthood (10).

The concept of mindfulness dates back to more than two thousand years. Foundations of the concept can be traced back to the earliest Buddhist texts. The mindfulness consists of a receptive and judgment-free consciousness of the current events. Mindful individuals understand inner and outer realities freely and without distortion, and have the ability to confront a wide range of thoughts, emotions, and experiences (both pleasant and unpleasant). The mindfulness can be defined as a mental state that is characterized by judgment-free consciousness at the present moment (11). Mindfulness includes moment-to-moment discipline, order, and awareness of daily life. In general, mindfulness involves a state in which, despite objective awareness of internal thoughts and events, there is no attempted cognitive response (affirmative evaluation, conceptual analysis, and attempt to control and suppress) or behavioral response, and especially there is no challenge with negative thoughts (12).

In a study by Yook et al. (13), they reported a significant improvement in Pittsburgh sleep quality scores among 19 patients with anxiety and insomnia disorders after 8 weeks of mindfulness-based cognitive therapy. Kazemi-Zahrani and Jalali (14) also found that mindfulness was effective in

tolerating distress in drug-addicted patients and also reduced anxiety and rumination.

Dialectical behavior therapy is a cognitive-behavioral approach that was first devised to treat borderline personality disorder. The approach combines cognitive-behavioral interventions based on the change principle with teachings of the Eastern Zen philosophy that is based on the principle of acceptance, and thus proposes four intervention components in its group therapy approach. Core mindfulness and distress tolerance are components of acceptance; and emotional regulation and interpersonal effectiveness as components of change (15, 16).

According to Linehan et al. (17), a major drawback of the cognitive approaches is that they do not integrate the views of the therapists and patients, as they often emphasize changes in clients' emotions, cognitions, and behavior. In these situations, clients feel that the treatment process not only makes their behavior invalid, but also makes them invalid people. Perceived invalidation causes problems in the treatment session. Linehan et al. (17) solves the above treatment problem by applying principles of Zen ritual, especially by using mindfulness training. The mind ritual is based on the pure acceptance of reality. On the other hand, unconditional acceptance and over-validation of clients' behavior also cause problems; for instance, clients feel that their problems are not taken seriously into account. Intervening behavior will occur again in treatment without paying attention to change and problem solving. Therefore, combining the two approaches together to balance change and acceptance of reality seems to be an appropriate solution (18).

Nadimi (19) found that dialectical behavior therapy significantly improved and increased distress tolerance on all subscales (tolerance, absorption, appraising, and regulation). There was no change in the participants' responses at the follow-up stage. Rezaei et al. (20) indicated that the dialectical behavior therapy was effective in improving emotion regulation strategies and reducing distress tolerance in methadone-treated patients. Studies also indicated that the dialectical behavior therapy was effective in reducing sleep problems and eliminating the factors that hindered a proper and restorative sleep (21). Therefore, the present study aimed to compare the effectiveness of dialectical behavior therapy and mindfulness training in improving the sleep quality and reducing distress tolerance in drug-addicted treatment seekers.

Methods

The research method was quasi-experimental with pretest-posttest design and control group. The statistical population included all the clients with addiction disorder who referred to mid-term addiction treatment centers in Baghmalek city during 2018. Participants in this study were in the quitting process of addiction. After diagnosis with addiction by a physician and clinical psychologist based on diagnostic criteria of DSM-V, they were classified into three experimental groups with intervention: mindfulness training; dialectical behavior therapy; and combination of dialectical behavior therapy and mindfulness training. The training sessions were conducted by the first author in the addiction center of Baghmalek city. The control group received no intervention. Using a convenience sampling method, we first selected 120 men who were admitted in the mid-term residential addiction treatment center, and then 80 individuals were randomly assigned to three experimental and one control groups (n=20 per group). The inclusion criteria were: drug abuse diagnosis based on diagnostic and statistical manual of mental disorders criteria fifth edition; drug use for at least six months; no serious psychiatric illnesses; age range of 18 to 50 years; male gender; reading and writing skills; lack of participation in other therapies; and willingness to participate in therapy sessions. Exclusion criteria were: participants' dissatisfaction with attending therapy sessions; absence more than two sessions; discontinuation of treatment under the supervision of addiction treatment centers.

Questionnaires were filled out after the participants' willingness and written informed consent was obtained from the participants in this study.

Assessment Instrument

Pittsburgh Sleep Quality Index (PSQI): The PSQI was utilized to measure the sleep quality. The questionnaire is a self-report tool that is designed by Buysse et al. (22). It has 9 questions for assessing sleep quality over a month and includes 7 scales used to obtain an integrated assessment of sleep quality. Questionnaire subscales include: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction. Getting a total score above 5 on the whole questionnaire means poor sleep quality. The validity and reliability of the PSQI and its sensitivity have been investigated in numerous foreign and local studies. Buysse et al. (22) reported sensitivity and specificity of this questionnaire equal to 89.6 and 86.5%, the internal validity of 83%, and

validity of 85% in the test-retest. The test-retest reliability of the questionnaire was 87% in a study by Backhaus et al. (23). In Iran, Mokarami et al. (24) reported a Cronbach's alpha coefficient of 89% and Mahdizadeh et al. (25) reported reliability of 93% by Cronbach's alpha.

Distress Tolerance Scale (DTS): Distress Tolerance Scale by Simons and Gaher (7) is a 15-item scale and its items measure distress tolerance based on the individual ability to tolerate emotional distress, subjective assessment of distress, attention to negative emotions when they occur, and regulatory measures to relieve distress. The items are scored on a five-point Likert scale. Score 1 means complete agreement with an item; and score five means complete disagreement with an item. High scores on this scale indicate high distress tolerance and low scores indicate low distress tolerance. The results indicate that there is a general factor on the scale. However, the first four factors, namely tolerance (I cannot handle my sense of distress), absorption (when I am distressed, I always think about how bad I feel), appraising (tolerance of distress is always very difficult for me), and regulation (I do everything to prevent my emotions from happening), were discovered after doing the confirmatory factor analysis. Shams et al. (26) estimated Cronbach's alpha of 0.672 for the questionnaire. Reliability coefficient was 0.81 for the whole scale according to the test-retest; and its validity was 79%. It was 0.71, 0.77, 0.69 and 0.73 for tolerance, absorption, appraising and regulation subscales, respectively. In the present study, the reliability of the questionnaire was 0.83, indicating acceptable reliability coefficients of the questionnaire. Tables 1 and 2 present summaries of treatment sessions.

Intervention Program

The first intervention program consisted of twelve 45-minute sessions of mindfulness training. This intervention was performed by van Son et al. (27) on the outpatients with diabetes. This protocol was used by Asghari et al. (28) in women with addicted spouses, and the results showed good validity. (Table 1 presents a summary of sessions). The second intervention program consisted of twelve 45-minute sessions of dialectical behavior therapy. This intervention was performed by Linehan et al. (29) in the opioid-dependent women. This intervention was used by Narimani et al. (30) in methamphetamine-dependent patients and the results showed good validity. (Table 2 presents a summary of the sessions).

Statistical Analyses

The Levene's test was utilized to examine the

Table 1: Description of mindfulness training sessions

Sessions	Content	Assignments
Session 1	Introducing participants; providing explanation about addiction and impact of addiction on family and its members; and discussing marital burnout, discussing that many people live in a non-mindfulness style and often overlook what they do.	Training how to eat raisin
Session 2	Inviting participants to talk about their experiences of mindfulness training, examine barriers, discuss some features of mindfulness such as being judgmental or dropping out, practicing thoughts and feelings, sitting meditation training with a focus on breathing.	Breathing-focused meditation training; body-checking training
Session 3	Sitting meditation training with a focus on breathing, body, voices, and thoughts, and discussing the acknowledgment and acceptance of reality of present situation as it is; and training the second series of conscious body movement.	Sitting meditation training by focusing on breathing
Session 4	The three-minute breathing space, and discussion of our thoughts. The content is not often real.	The second series training of conscious body movement.
Session 5	Sitting meditation and open awareness (whatever comes into mind from moment to moment); discussing the best way to take the self-care; practicing daily activities against unpleasant activities, and learning to plan pleasant activities, and love and kindness meditation training.	Love and kindness meditation training
Session 6	Physical examination training; discussing what you have learned so far; evaluating training; and providing more resources.	Exercise physical training
Session 7	Learning how to include mindfulness into thoughts and emotions	Love and kindness meditation training
Session 8	Drug-use meditation training and the way of using the mindfulness training	Physical examination training
Session 9	Drug-use meditation training and the way of using the mindfulness training	Sitting meditation training by focusing on breathing
Session 10	Drug-use meditation training and the way of using the mindfulness training	Love and kindness meditation training
Session 11	Review of provided content in previous sessions	Physical examination training
Session 12	Getting feedback from members about provided principles, review and summary of previous content; recommending to plan daily activities; using techniques of mindfulness (mindful walking, music, and eating) in life and its generalization to the whole of life, and emphasizing the use of deep and diaphragmatic breathing.	Doing the whole training

equality of the variances. Box's test was used to test the assumption of the equality of variance-covariance matrices. The effect of independent variable was evaluated on each of dependent variables through one-way univariate analysis of covariance (ANCOVA). The post hoc LSD test was used to determine which groups were different. The method of matching individuals was used to control the effects of confounders. SPSS software (version 25.0) was used for data analysis. A significance level of 0.05 was considered statistically significant.

Results

The mean±SD of the participants' age in the dialectic behavior therapy, mindfulness training, combination of mindfulness training and dialectical behavior therapy and control were 34.42±5.23, 33.19±7.46, 34.70±7.80 and 35.19±6.32 years, respectively. The demographic characteristics of the participants are shown in Table 3.

Mean±SD of mindfulness training and dialectic behavior therapy groups in the pre-test stage for sleep quality variable were 17.02±2.22 and 15.48±2.27, respectively. However, mean±SD of mindfulness training and dialectic behavior therapy groups in

the post-test stage were 13.15±2.41 and 11.87±2.55, respectively. In the follow-up stage, mean±SD of mindfulness training and dialectic behavior therapy groups for sleep quality variable were 12.89±2.48 and 12.90±2.49, respectively. The mean and standard deviation of the pre-test, post-test and follow-up scores in the mindfulness training and dialectic behavior therapy groups for sleep quality and distress tolerance variables are shown in Table 4.

All four multivariate statistics, which were related to Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root were significant at a confidence level of 0.99%. Therefore, the null hypothesis was rejected and the linear combination of 2 dependent variables was affected by independent variable (treatment program) after adjusting differences of 2 associated variables. Given that all four tests were significant, the effect of independent variable was evaluated on each of dependent variables through the one-way univariate analysis of covariance (ANCOVA).

The results of a univariate test for sleep quality ($P=0.001$ and $F=37.03$) and distress tolerance ($P=0.000$ and $F=124.33$) were significant at a confidence level of 0.95%.

Table 2: Description of dialectical behavior therapy sessions

Sessions	Content	Assignments
Session 1	Preliminary description; conceptualization of problem; preparation of sample participants; and implementation of pre-test and training of distraction skills; signing contracts to reduce self-destructive behavior; and preparing a list of enjoyable activities; and including them into the weekly program.	Preparing a list of enjoyable activities and including them in the weekly program
Session 2	Emotional awareness training of participants about what skills are observed and described and how the skills are not judged, are focused, and work.	Distraction skill training
Session 3	Emotional awareness re-training of participants about what skills are observed and described and how the skills are not judged, are focused, and work	Sitting meditation training by focusing on breathing
Session 4	Examining thoughts and feelings, and explaining and identifying coping responses that are internal or external. With clients' cooperation, thoughts and feelings leading to self-destructive or tempting and maladaptive behavior are examined.	In homework, clients are asked to list all thoughts and feelings that lead to their maladaptation
Session 5	Distress tolerance training (skills of crisis resilience, distraction, self-healing using six senses, and emotional awareness training)	Self-reliance training with six senses
Session 6	Clients are helped to practice to control their impulsive behavior and provide feedback to reach a rational level of mastery and control. Clients, for example, are taught that internal responses are thoughts that are incompatible with impulses. For instance, saying to themselves: This is really ridiculous. I will smile instead of being angry. Practice and feedback.	Emotional awareness training
Session 7	Reducing the physical vulnerability to overeating and anorexia, Drugs, Alcohol, Exercise, Physical Illness and Pain, Sleep Health, Physical stress and tension, Identifying Self-Destructive Behavior, Self-monitoring without judgment, reducing cognitive vulnerability, and Increasing positive emotions	Training the self-monitoring without judgment
Session 8	Emotional regulation training (goals of emotion regulation training; knowing why emotions are important; recognizing emotion; reducing vulnerability and emotional suffering; enhancing positive emotion); changing emotions through an activity contrary to recent affection.	Emotional regulation training
Session 9	Emotional regulation re-training (goals of emotion regulation training; knowing why emotions are important; recognizing emotion; reducing vulnerability and emotional suffering; enhancing positive emotion); changing emotions through an activity contrary to recent affection.	Emotional regulation training
Session 10	Increasing interpersonal effectiveness (Maintaining healthy communication with relatives; Interests, etc.); Training important personal skills (Description, expression, assertiveness and daring, open confidence, negotiation and self-esteem)	Description, expression, assertiveness and daring training
Session 11	Increasing interpersonal effectiveness (Maintaining healthy communication with relatives; Interests, etc.); Training important personal skills (Description, expression, assertiveness and daring, open confidence, negotiation and self-esteem)	Description, expression, assertiveness and daring training
Session 12	Summarizing, training and reviewing the previous sessions and then the implementation of post-test	Doing the whole training

Table 3: Demographic characteristics of the participants

Groups	Age (Mean±SD)	Education			
		Middle school degree	Diploma	Associate degree	Bachelor and master's degree
Dialectic behavior therapy	34.42±5.23	9	6	3	2
Mindfulness training	33.19±7.46	8	7	3	2
Combination of mindfulness training and dialectical behavior therapy	34.70±7.80	6	10	2	2
Control	35.19±6.32	6	11	2	1

The post hoc LSD test was used to determine which groups were different and the results showed that there was a significant difference between the mean of control group and the other two groups ($P<0.05$), indicating that each of two treatment

methods affected the improvement of sleep quality. The difference between the mean of control group and the other two groups was significant ($P<0.05$); hence, either of the two treatment methods was effective in improving distress tolerance. The difference between

Table 4: Descriptive findings for the variables of sleep quality and distress tolerance

Variables	Mindfulness training			Dialectic behavior therapy			Combination of mindfulness and dialectical behavior therapy		
	Pre-test	Post-test	Follow-up	Pre-test	Post-test	Follow-up	Pre-test	Post-test	Follow-up
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Sleep quality	17.02±2.22	13.15±2.41	12.89±2.48	15.48±2.27	11.87±2.55	12.90±2.49	16.65±2.93	12.75±2.88	12.68±2.66
Distress tolerance	31.30±2.43	64.70±3.41	63.81±3.36	31.30±2.52	65.70±1.70	64.50±3.32	32.25±2.42	67.54±3.12	63.50±3.32

mindfulness and dialectical behavior therapy groups was not significant ($P < 0.05$); hence, two methods had similar effects on the participants.

Discussion

The present study aimed to compare the effectiveness of dialectical behavior therapy and mindfulness training in improving sleep quality and reducing distress tolerance in drug-addicted treatment seekers. Based on the results, dialectical behavior therapy and mindfulness training were effective in improving the sleep quality and decreasing the distress tolerance in drug-addicted treatment seekers. In a study by Yook et al. (13), they reported a significant improvement in Pittsburgh sleep quality scores among 19 patients after 8 weeks of mindfulness-based cognitive therapy. Britton et al. (31) studied the consequences of insomnia in 7 women after a mindfulness program and found that waking up at night was decreased. Masuda and Tully (32) reported that mindfulness could play roles in reducing distress. The basis of mindfulness discussion is that improved self-awareness and insight increases the individual ability to use coping skills at an early stage of negative emotion or experience. This increased awareness is a state in which people do not respond to the stimuli of substance abuse and tolerate its associated distress (33).

Mindfulness has positive therapeutic effects on the addiction distress tolerance. It reduces coping with distress tolerance in addicts due to its underlying mechanisms such as acceptance, higher awareness, desensitization, presence in the moment, and observation without judgment (34). Lengacher et al. (35) investigated positive effects of mindfulness on sleep components. Furthermore, Bogusch et al. (36) found that high levels of mindfulness were associated with higher sleep quality.

Dialectical behavior therapy (DBT) is an innovation in the psychological treatment, especially in distress tolerance of drug abuse. The DBT aims to provide balance between changes and acceptance and teaches the clients how to regulate their emotional response. The dialectical behavior therapy is thus an innovation in the psychological treatment (37).

Dialectical behavior therapy is effective in improving the symptoms of insomnia in addicts; thus, increasing the suffering and sorrow tolerance, accepting emotions through attention focused on the present, and correcting the false emotional beliefs can prevent a good sleep (38).

Kirchner (39) found that dialectical behavior therapy focused on the individual maladaptive behavior, such as drug abuse, as an action to regulate or eliminate boring or unwanted emotions during distress tolerance. Nadimi (19) found that the dialectical behavior therapy training could improve and increase the rate of distress tolerance that was the main cause of drug use and persistence in people. Research findings indicated that dialectical behavior therapy significantly improved and increased distress tolerance on all its subscales (tolerance, absorption, appraising and regulation). There was also no change in individual responses during the follow-up period; hence, it can be concluded that the effect of dialectical behavior therapy (DBT) was stable on all subscales after this period. Haghayegh et al. (21) concluded that dialectical behavioral therapy, as a selective effective psychotherapy, was effective in reducing the sleep disorders and improving the sleep quality.

In explaining the above findings, we can conclude that mindfulness training is designed to help clients raise awareness and change challenging situations, including negative emotional status and positions without automatic and habitual reaction. In mindfulness, individuals accept experiences as separate elements of themselves and as a transient state and subject for change; hence, they accept experiences like other neutral or non-emotional experiences and finally internalize them instead of exploring the subject or cognitive or behavioral avoidance of that experience that are both painful (40).

As the effectiveness of dialectical behavior therapy, we can conclude that dialectical behavior therapy skill training by informing people, who are avoiding substance use, about temptation and its associated positive and negative emotions, and accepting and dealing with them effectively can improve their mental health. The Dialectic Behavior Therapy is a

therapeutic approach that focuses on developing a healthy lifestyle and effective coping behavior. It has a clear structure and simultaneously uses behavioral and accreditation techniques (41).

Conclusion

Increasing the psychological flexibility in dialectical therapy and creating a mindfulness-based thinking can improve the patient's ability to cope with insomnia, improve sleep quality, and increase distress tolerance. In the study, effects of both methods were similar and did not differ significantly. Results of the present study can be applied from various aspects and fields, including psychology, counseling and psychotherapy for drug addicts.

Limitations of the present study were as follows: the number of female samples was small; thus the study was only conducted on men. The demographic characteristics of the participants in terms of duration of consumption, history and type of other drugs, short follow-up phase (one month) were not the same. In future studies, it is suggested that these therapies should be conducted in conjunction with drug treatments.

Conflict of Interest: None declared.

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