

## Research Paper

# Effectiveness of Mindfulness-based Stress Reduction and Dialectical Behavior Therapy on Pathological Worry and Difficulty in Emotion Regulation in Students With Depression Symptoms



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**Citation** Mousavi FM, Marashian FS, Bakhtiarpour S. Effectiveness of Mindfulness-Based Stress Reduction and Dialectical Behavior Therapy on Pathological Worry and Difficulty in Emotion Regulation in Students With Depression Symptoms. *Journal of Research & Health*. 2022; 12(3):193-202. <http://dx.doi.org/10.32598/JRH.12.3.1973.1>

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## ABSTRACT

**Background:** High school students may experience stress, worry, anxiety, educational problems, and psychological damage because of high workload, expansive cognitive assignments, and being in a competitive space regarding their assignments and the university entrance exam. The present study aims to investigate the effectiveness of mindfulness-based stress reduction (MBSR) and dialectical behavior therapy (DBT) on pathological worry and difficulty in emotion regulation in students with depression symptoms in Dehloran City, Iran.

**Methods:** This was a quasi-experimental study based on a pretest-posttest design with a control group. The statistical population comprised all 12-grade female students studying for the university entrance exam in the academic year of 2020-2021 in Dehloran City, Iran. A total of 45 students were selected through convenience sampling and randomly divided into MBSR, DBT, and control groups. The research instruments included the difficulties in emotion regulation scale, Penn State worry questionnaire, and Beck depression inventory-II. The data were analyzed via descriptive statistics and multivariate analysis of covariance.

**Results:** The Mean±SD of the pathological worry for MBSR, DBT, and control groups in the posttest phase were 33.67±3.69, 31.00±3.87, and 37.78±3.96, respectively. Moreover, the Mean±SD of the difficulty in emotion regulation in the posttest phase for MBSR, DBT, and control groups were 62.00±6.18, 61.60±6.95, and 72.20±6.84, respectively. The results indicated that the differences between MBSR and DBT groups with the control group were significant in terms of the scores for pathological worry and difficulty in emotion regulation of the university entrance exam applicants with depression symptoms in the posttest stage ( $P < 0.001$ ).

**Conclusion:** MBSR and DBT can be recommended to school counselors as effective interventions to improve emotion regulation and pathological worry in university entrance exam applicants with depression symptoms.

**Keywords:** Mindfulness, Dialectical behavior therapy, Emotional regulation, Depression, Students

### Article info:

Received: 18 Dec 2021

Accepted: 12 Feb 2022

Publish: 01 May 2022

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## 1. Introduction

Students are the human assets of every society as they spin the wheels of development, progress, and culture through acquiring skills and sciences [1]. High school is among the most crucial periods during education since at this stage, students face special biological, psychological, emotional, and social conditions. High school students may experience stress, worry, anxiety, educational problems, and psychological damage because of high workload, expansive cognitive assignments, and being in a competitive space regarding their assignments and the university entrance exam [2]. In addition, the university entrance exam in this grade aggravates the psychological and emotional pressures. Consequently, students' educational problems and psychological distress become more apparent [3, 4].

The applicants for the university entrance exam require special skills and control of psychological variables and situations to carry out their schoolwork and promote their educational performance. Therefore, one of the psychological needs and variables of their psychological situation is pathological worry. Worry is a cognitive process that is concerned with consecutive and repetitive thoughts regarding personal concerns, as well as problems at the end of this train of thoughts. In other words, worry causes more worries, has a verbal and abstract nature, and is associated with doubt and skepticism [5]. Worry is a train of thoughts and imaginations accumulated with negative and relatively uncontrollable emotions. It is an effort to resolve psychological problems regarding a subject with an unknown but negative outcome. Worry is divided into two sections of normal and pathological. The pathological worry is defined by its frequency, severity, and duration. The ability to control it and its interference in the function of individuals are what differentiates it from normal worry [6]. Evidence suggests that anxious people, plus students with pathological worry manifest more problems and difficulties in educational performance, emotion regulation, and so on. In addition, the reduction of pathological worry and anxiety, as well as the increase of control and emotional regulation pertain to the improvement of students' judgment, the increase of their self-efficacy regarding social, emotional, and educational adaptation, and the increase of friendly behavior [7].

The difficulty in emotion regulation is among other determinants of the educational and psychological state of students. Emotion regulation is concerned with the capacity to supervise, evaluate, understand, and correct

emotional reactions in a manner that is useful for normal performance. It includes a process through which individuals regulate their emotions, either consciously or subconsciously, via correcting experiences or changing the emotion evocator situation [8]. On the other hand, difficulty in emotion regulation and dysregulation is the maladaptive strategies in reaction to emotional states and experiences of individuals [9, 10]. Given the results of related studies, difficulty in emotion regulation and dysregulation can cause serious damage to psychological health [11, 12]. In other words, effective emotion regulation can reduce the emotional reaction to stressful situations. Accordingly, difficulty in emotion regulation is pertinent to referential thoughts in students and is known as a key mechanism in anxiety disorders [13].

Controlling and improving pathological worry and difficulty in emotion regulation are abilities that help students reduce or modify their psychological stress and pressures caused by school courses, university entrance exams, and the educational environment. Such abilities enable them to fully enjoy the available capacities in difficult educational situations to fulfill their goals. However, in today's society and university entrance exams, the intensified and stressful competition causes psychological distress and worry, as well as difficulty in emotion regulation in students. Consequently, it leads to psychological disorders and problems in some students. Therefore, it is essential to utilize psychotherapy and counseling services in this regard [14].

To strengthen and improve the psychological state of students, the third wave therapies, particularly educational and therapeutic approaches such as mindfulness-based stress reduction (MBSR) and dialectical behavior therapy (DBT) are used as effective methods for treating the majority of psychological problems, diseases, disorders in disparate clinical populations, and particularly psychological distress in students [15, 16].

The MBSR program is a group therapy in which patients are trained to perform various mindfulness exercises, such as seated meditation, body scan meditation, yoga, and compassionate mind meditation [17]. Mindfulness is regarded as paying attention to special methods, goal-directed, at the present time, and without judgment. In mindfulness, a person learns to maintain a moment-by-moment awareness at any mental state and focus their attention on various mental techniques [18]. One of the outcomes of mindfulness exercises is that it enables individuals to understand that the majority of effects, thoughts, and emotions are transient and pass like ocean waves. Individuals are encouraged to pay atten-

tion to their internal experiences at every moment, such as their physical sensations, thoughts, and effects [19]. Various studies have revealed and approved the effectiveness of this method in reducing individuals' psychological damage [20, 21]. Shahidi et al. [18] reported that the MBSR program had continuous significant effects on test anxiety and emotion regulation in students. Keng et al. [21] showed that the participants in the MBSR condition demonstrated significantly greater improvements in depression symptoms, trait mindfulness, and self-compassion compared to the control condition. In addition to reducing educational problems, the MBSR program can decrease various conditions that cause problems, such as stress, anxiety, depression relapse, and eating disorders [18].

DBT is another type of psychotherapy whose effectiveness has been proved in disparate clinical populations via different studies [22, 23]. DBT is developed for treating emotional dysregulation, and behavioral problems, as well as treating problems of individuals with borderline disorder and suicidal ideation [24]. DBT is the changed version and the correction of cognitive behavioral therapy. This therapy is appropriate for individuals who have difficulty in emotion regulation [25]. DBT seeks to influence the failures and problems about cognitive, emotional, behavioral, interpersonal problems, and communicative issues by using mindfulness skills, distress tolerance, emotion regulation, and interpersonal skills [26].

The studies demonstrated that DBT has been effective and efficient in disparate psychological states and various clinical populations, especially in different statistical populations of students [27, 28]. Rahbar Karbasdehi et al. [22] reported that DBT can be an appropriate therapy to reduce anxiety in adolescents with leukemia and increase resilience in people with chronic diseases; it can also result in life satisfaction among adolescents. Pistorello et al. [27] reported that DBT is an effective treatment for suicidal, multi-problem college students. Zapolski and Smith [28] reported that a brief DBT skills group can be an effective program that school nurses and health care teams can utilize to reduce health risk behaviors among the school-aged youth. Streen et al. [29] manifested that DBT increases the positive and motivational beliefs, hope, and formation of meaning in depressed female students.

In previous studies, the effectiveness of MBSR and DBT interventions have been studied separately for depression, difficulty in emotion regulation, and other psychological characteristics in different statistical com-

munities, such as psoriasis patients, patients with chronic pain, patients with diabetes, and couples with marital conflict [30-34]. However, no study is conducted to investigate the effectiveness of MBSR and DBT interventions on pathological worry and difficulty in emotion regulation in university exam students with depression symptoms. In addition to its decisive role in the fate and future of students, the university entrance exam also leads to psychological damages, which in some cases are irreparable. Therefore, identifying and explaining therapeutic interventions that can be effective in controlling mental injuries and improving students' mental health is of great necessity. Accordingly, the present study aims to investigate the effectiveness of MBSR and DBT on pathological worry and difficulty in emotion regulation in students with depression symptoms.

## 2. Methods

The study method was quasi-experimental based on a pretest-posttest design and a control group. The statistical population comprised all female students in the academic year of 2020-2021 from Dehloran City, Iran selected from four high schools. We selected 45 female university entrance exam applicants who were willing to participate in the study using convenience sampling, and based on inclusion criteria. Fifteen students were included in each group via G\*Power software with an effect size of 0.80, a test power of 0.95, and an  $\alpha$  of 0.05. We randomly divided the students into two experimental groups (MBSR and DBT) and one control group (n=15 per group).

The inclusion criteria comprised the following items: being a participant in the university entrance exam, getting a score above the mean in the Beck depression inventory-II (BDI-II), not receiving any simultaneous psychological or pharmaceutical treatment, and offering a written consent letter to participate in the study.

The exclusion criteria were more than two absences from the treatment sessions and reluctance to continue the treatment process. Then, the questionnaires were distributed among the participants. One experimental group received the MBSR package and the other received the DBT package, one session per week and executive instructions. The control group received no psychotherapy or training during this time. Finally, after completing the sessions, all three groups performed the posttest. In addition, a therapeutic course was performed on the control group after the completion of the study to practice the ethical considerations.

## Research tools

### Difficulties in Emotion Regulation Scale

The difficulties in emotion regulation scale (DERS) was developed by Gratz and Roemer [35]. This 36-item scale comprises one total score and six specific scores in subscales regarding various dimensions of DERS. The questionnaire is scored based on a 5-point scale (never=1, seldom=2, almost in half cases=3, sometimes=4, and almost always=5). The results regarding the validity and reliability of this scale revealed a high internal consistency (0.93). Dehdashti Lesani et al. [36] also reported the internal consistency of 0.92 and the reliability of 0.87 for this scale. In this study, the reliability of 0.86 was obtained using the Cronbach  $\alpha$ .

### Penn State Worry Questionnaire

The Penn State worry questionnaire (PSWQ) is a self-report questionnaire for evaluating pathological worry. This scale includes 16 items and is scored based on a 5-point Likert scale. The scores range from 16 to 80 [37]. In Iran, Dehshiri et al. [38], reported the reliability of the scale to be 86% via internal consistency test, and 77% through the retest method four weeks apart. In this study, the Cronbach  $\alpha$  was obtained at 0.81 for the questionnaire.

### Beck Depression Inventory-II

The Beck depression inventory-II (BDI-II) is a short 13-item self-report developed by Beck to assess depression symptoms, such as emotional, cognitive, motivational, and physiological depression. It comprises several groups of questions, with each question expressing a state. This questionnaire includes a 4-item scale, with scores ranging from 0 to 39. Amiri et al. [39] reported the Cronbach  $\alpha$  of 0.84, which indicates the good reliability of the inventory. In the present study, the Cronbach  $\alpha$  was obtained at 0.82.

## Intervention program

The first experimental group received eight 60-minute sessions (one session per week) of MBSR, according to the Kabetsink [40] protocol. The second experimental group received eight 90-minute sessions (one session per week) of DBT, according to the Chapman [41] protocol. All therapy sessions were performed by the first author who had taken specialized courses and workshops. Table 1 and Table 2 provide a summary of the sessions.

## Statistical analyses

The effectiveness of MBSR and DBT on pathological worry needs and difficulty in emotion regulation in students showing depression symptoms was studied by multivariate analysis of covariance (MANCOVA). The SPSS software, version 24, was then used to analyze the data.

## 3. Results

The participants included 45 students showing depression symptoms, aged  $17.68 \pm 1.35$  years. Table 3 lists the mean and the SD of pathological worry and difficulty in emotion regulation scores for the MBSR, DBT, and control groups on the pretest and posttest phases.

The hypotheses were examined to ensure that the data can estimate the hypotheses of the analysis of covariance (ANCOVA), before analyzing the data regarding the hypotheses. Therefore, 5 assumptions of the ANCOVA, including linearity, multicollinearity, variance convergence, regression slope convergence, and normality of variable distribution were investigated. According to the results of the Kolmogorov-Smirnov test, the assumption of normality of scores in the intervention and control groups was met for pathological worry and difficulty in emotion regulation. The assumption of normality of scores in the pretest was met for the intervention and control groups. Moreover, the F value was not significant for pathological worry and difficulty in emotion regulation ( $P > 0.05$ ). Therefore, the assumption of homogeneity of regression was met. The Levene test was not significant for pathological worry and difficulty in emotion regulation ( $P > 0.05$ ). The results suggested that the experimental groups and the control group were convergent in terms of the covariances before the experimental intervention (in the pretest stage). The statistical MANCOVA on the MBSR, DBT, and control groups indicated significant differences in these groups at least in one of the dependent variables.

Table 4 shows the ratio of F in the ANCOVA for the pathological worry variables ( $F = 62.04$ ,  $P < 0.001$ ) and difficulty in emotion regulation ( $F = 168.09$ ,  $P < 0.001$ ). These results demonstrated that the MBSR, DBT, and control groups have significant differences in terms of the dependent variables (pathological worry and difficulty in emotion regulation).

Table 5 shows that the MBSR, DBT, and control groups have significant differences in terms of pathological worry and difficulty in emotion regulation variables. In

Table 1. Content of mindfulness-based stress reduction sessions

Sessions	Contents
1	The participants are asked to deeply feel the process of eating a raisin and then discuss their feeling. This is followed by 30 minutes of body scan meditation (paying attention to a body part while breathing).
2	The participants are encouraged to perform body scan meditation and then discuss this experience and the experience of doing their homework. Barriers to the exercise (restlessness and wandering mind) and solutions to these problems (being non-judgmental and releasing intrusive thoughts) are discussed. The participants are then asked to perform sitting meditation.
3	The participants are requested to watch and listen non-judgmentally for 2 minutes. This task is followed by sitting meditation and breathing while paying attention to bodily sensations.
4	The participants are asked to identify a higher power and establish a better relationship with it, using self-encouraging and self-confirming coping thoughts, a list of coping thoughts, and developing a coping plan for emergencies (confirming self-talk, exercise, sleep hygiene), increasing positive emotions, and non-judgmental self-monitoring.
5	The participants pay attention to breathing, the sounds of their body, and their thoughts. Then, they discuss stress responses and reactions to difficult situations, as well as alternative attitudes and behaviors. Finally, they practice mindful walking.
6	The session begins with a 3-minute breathing space exercise. The participants practice the theme of "the content of thoughts is largely unreal." Next, they perform four meditation exercises sequentially for 1 hour.
7	This session begins with 4-dimensional meditation and awareness of whatever enters one's consciousness at the moment. The theme of this session is "what is the best way to take care of myself?"
8	The theme of this session is "using what you've learned so far." This session starts with body scan meditation, followed by a 3-minute breathing space.



Table 2. Content of dialectical behavior therapy sessions

Components and Sessions	Skills	Contents
Fundamental core mindfulness (Sessions 1 and 2)	What skills (observe, describe, participate)	Conscious breathing, 1-minute concentration, concentration on an object, a full concentration at the moment, wise mode training, and practicing decision-making based on the wise mode
	How skills (non-judgment, core mindfulness, effectiveness)	Practicing negative judgments and their positive forms, recognizing judgments and labels, training in the daily mindfulness program, enhancing mindfulness skills through kindness and compassion, and practicing meditation to attain peace and silence
Distress tolerance (Sessions 3 and 4)	Crisis survival skills (distraction, self-soothing, improving the moment, advantages and disadvantages)	Distraction through counting, distracting one's attention from self-harming behaviors, self-soothing through the 5 senses, visualizing (imagining) a safe place, making a list of pleasurable activities, and including them in a weekly schedule
	Reality acceptance skills (radical acceptance, turning the mind, satisfaction)	Identifying a higher power and establishing a better relationship with it, using self-encouraging and self-confirming coping thoughts, a list of coping thoughts, developing a coping plan for emergencies (confirming self-talk, exercise, sleep hygiene), increasing positive emotions, non-judgmental self-monitoring
Emotion regulation (Sessions 5 and 6)	Identifying and naming the emotions, identifying barriers to changing emotions, reducing vulnerability to emotions, increasing positive emotional events	Identifying and recognizing the emotions, emotion identification exercise, recognizing the barriers to healthy emotions through the thought, feeling, and behavior model, recognizing emotions that lead to dangerous and harmful behaviors, thought-emotion balance by filling a worksheet
	Promoting emotion awareness, opposite action, using distress tolerance skills and techniques	Non-judgmental mindfulness of emotions, dealing with emotions, recording the emotions and completing the emotion registration form, opposite action to intense emotional desires, completing the opposite action planning exercise, using the weekly worksheet to reduce vulnerability
Interpersonal relationship (Sessions 7 and 8)	Skills for expressing needs, saying no firmly	Making a simple request (with practice), balancing one's and others' needs, adjusting the intensity of desires, practicing the skill of saying no, training negotiation, assertiveness skills
	Coping or dealing with unavoidable interpersonal conflicts	Self-knowledge, valuing oneself, writing one's rights, identifying communication styles, interpersonal skills acquisition, identifying barriers to implementing interpersonal skills, identifying passive strategies in relationships (shyness), identifying interpersonal problems



**Table 3.** Mean±SD of the variables in experimental and control groups

Variables	Phases	Mean±SD		
		MBSR	DBT	Control
Pathological worry	Pretest	38.53±4.06	38.27±3.21	37.87±3.70
	Posttest	33.67±3.69	31.00±3.87	37.78±3.96
Difficulty in emotion regulation	Pretest	69.87±6.54	71.13±7.28	71.63±7.24
	Posttest	62.00±6.18	61.60±6.95	72.20±6.84



**Table 4.** Results of one-way analysis of covariance on dependent variables in experimental and control groups

Variables	Source	SS	df	MS	F	P	η <sup>2</sup>
Pathological worry	Pretest	2.39	1	2.39	1.14	0.336	0.04
	Group	410.45	2	205.22	62.04	<0.001	0.75
	Error	72.39	41	1.76			
Difficulty in emotion regulation	Pretest	6.75	1	6.75	2.51	0.096	0.07
	Group	938.30	2	469.15	168.09	<0.001	0.89
	Error	162.03	41	3.492			



addition, comparing the MBSR and DBT methods about pathological worry and difficulty in emotion regulation was significant in favor of the DBT.

#### 4. Discussion

The present study aimed to investigate the effectiveness of MBSR and DBT on pathological worry and difficulty in emotion regulation in students with depression symptoms in Dehloran City, Iran. According to the findings, MBSR and DBT were effective in reducing patho-

logical worry and difficulty in emotion regulation of female high school students with depression symptoms. Based on the results of the present study, DBT was more effective in reducing pathological worry and difficulty in emotion regulation in the students.

The findings confirmed the role of mindfulness in reducing reactivity and improving emotion regulation when faced with stressful situations. Mindfulness removes the unpleasant emotional stimulants and increases emotional flexibility. It can also improve individuals'

**Table 5.** Bonferroni post-hoc test for pairwise comparison of the dependent variables

Variables	Groups	Mean Difference	SE	P
Pathological worry	MBSR-Control	4.93	0.66	0.001
	DBT-Control	7.26	0.66	0.001
	MBSR-DBT	2.33	0.66	0.003
Difficulty in emotion regulation	MBSR-Control	8.83	0.61	0.001
	DBT-Control	10.62	0.61	0.001
	MBSR-DBT	1.58	0.61	0.041



self-improvement through moment-to-moment, non-judgmental, and step-by-step awareness control. The MBSR therapy improves the emotion regulation skills by increasing the positive mood; in addition, it modifies the emotion regulation strategies by increasing consciousness and accepting the emotions experienced by individuals [18]. Individuals with high mindfulness are in a non-judgmental and balanced state of awareness, which facilitates seeing clearly and accepting emotions and physical, mental, behavioral, and sensory phenomena as they happen. Meanwhile, high mindfulness helps individuals to accept the existence of negative emotions and tolerate them as a part of their emotion regulation skills [19]. Individuals with high mindfulness enjoy proper knowledge regarding cognitive processes and their capabilities, plus a deep subjective relationship with emotions. They also possess effective strategies for dealing with assignments, while mindfulness increases the awareness regarding self and others, emotions, and situations at present time. This increase in awareness has a positive impact on both dimensions of emotions [17]. It can be concluded that training MBSR can improve emotion regulation skills and reduce the difficulties experienced in this regard.

Mindfulness as a targeted awareness and apart from the automatic preceptive processing creates a subjective framework that prevents undesired and emotional exaggeration and provides the individual with an opportunity to distance themselves from unpleasant emotional experiences [18]. Guendelman et al. [42] revealed that MBSR therapy targets mechanisms involved in changing the cognitive-emotional ordering strategies in patients with major depressive disorder. Besides, it can be an appropriate method for treating and preventing relapse of this disorder. Mindfulness helps create clear and transparent experiences and teaches individuals to live in the present moment; consequently, it can reduce negative psychological symptoms. Performing mindfulness exercises helps the development of various mindfulness factors, such as observing, being non-judgmental, being non-reactive, and acting with awareness. The development of these factors leads to a reduction of stress and psychological symptoms [43].

DBT uses cognitive techniques (relaxation, emotion regulation training to alleviate and deal with cognitive distortions, dealing with stress and negative thoughts, and so on), that help eliminate negative thoughts and contribute to the meaning of education and improving emotion regulation. DBT also utilizes behavioral techniques, such as exposure to and accepting reality to promote perceived communication competence.

Through exposure and regular desensitization, clients learn to gradually incorporate relaxation when dealing with people with whom they feel uncomfortable and incompetent to connect. This gradually reduces their stress, discomfort, and anxiety, and they achieve a sense of competence and connection [27]. Jamilian et al. [44] demonstrated the considerable impact of DBT on treating rage and aggressive behaviors in disparate clinical samples. Therefore, DBT promotes perceived competence and connection, thereby enhancing emotion regulation through cognitive and emotional strategies.

People with depression harbor more negative mental concepts about themselves and the environment because of their negative environment and communication. This cynicism is rooted in their negative view of themselves and others' negative view of them, which reduces perceived competence and disrupts connections. DBT uses re-conceptualization to prepare clients to acquire optimistic thinking skills, form new and positive concepts about themselves and others, and draw up a list of enjoyable activities. In this way, they improve their relationships and form positive and optimistic attitudes. This promotes the level of perceived connection and competence, leading to positive and constructive relationships with others and the world.

This study was limited to the students of Dehloran City, Iran; therefore, the results should be generalized with caution.

## 5. Conclusion

MBSR and DBT were effective in reducing pathological worry and improving difficulty in emotion regulation in university entrance exam applicants with depression symptoms. Therefore, MBSR and DBT can be recommended to school counselors as effective interventions to improve emotion regulation and pathological worry in university entrance exam applicants with depression symptoms.

## Ethical Considerations

### Compliance with ethical guidelines

The Ethics Review Board of Islamic Azad University Ahvaz Branch approved the present study (Code: IR.IAU.AHVAZ.REC.1399.114).

## Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

## Authors' contributions

All authors equally contributed to preparing this article.

## Conflict of interest

The authors declared no conflict of interest.

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