

# Effectiveness of Mindfulness-Based Stress Reduction (MBSR) on anxiety, depression and post-traumatic stress disorder symptoms in patients with HIV/ AIDS

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## Abstract

**Introduction:** Mindfulness plays an important role in improving psychological functions of chronic patients. Therefore the aim of this study was to investigate the effectiveness of Mindfulness-Based Stress Reduction (MBSR) on the symptoms of anxiety, depression and post-traumatic stress in patients with HIV/ AIDS.

**Method:** This study was an experimental design with a pre-test, post-test along with a follow-up group. By using convenience sampling, 30 HIV/ AIDS patients were selected. They were randomly assigned into two groups of experiment and control. The experimental group underwent mindfulness-based stress reduction therapy within two months. The scores of Beck Depression Inventory-II (BDI-II), Beck Anxiety Inventory (BAI) and Impact of Event Scale - Revised (IES-R), were collected from the two groups in pre-test, post-test and in a two-month follow up period. Data were analyzed using mixed analysis of variance test.

**Results:** The results in the post-test and follow up indicated that MBSR in the experimental group, significantly reduced the symptoms of post-traumatic stress disorder ( $P < 0.05$ ), anxiety ( $P < 0.05$ ) and depression ( $P < 0.05$ ) in HIV/ AIDS patients.

**Conclusion:** The results of this study revealed the effectiveness of mindfulness-based stress reduction on psychological functions in patients with HIV. According to these results and the mechanism of its effectiveness, this therapy can have good therapeutic implications.

**Keywords:** Mindfulness- Based Stress Reduction, Anxiety, Depression, Post-Traumatic Stress, HIV/AIDS

## Introduction

According to the statistics released by the World Health Organization and the Joint United Nations Program on HIV and AIDS (UNAIDS) by the end of 2013, thirty-five million people worldwide are living with HIV[1]. However, the number of new HIV infections have decreased by 21 percent between 1997 and 2010. Despite the global decline in the HIV incidence rate, the disease growth in the Middle East(which Iran is located in) and North Africa has placed these regions in the list of the two regions with the fastest growing prevalence of HIV in the world[2]. In addition to the physiological effects of AIDS, it also has irreparable psychological and social effects for people suffering from it.

The diagnosis of AIDS causes shock, outbreak of crisis, stress, and anxiety in the suffering patient and their families [3-5]. This is why the psychological consequences of AIDS will have profound impacts on the progress of this disease and adherence to medical recommendations [6]. The results indicated that between 20 to 60 percent of patients with HIV-AIDS suffer from psychiatric disorders, which among them anxiety and mood disorders have a higher prevalence [3, 5, 7, 8]. Statistics show that about half of the patients with HIV-AIDS are prone to mood disorders, which among them major depression and dysthymic disorders seem to be more common [9]. This could be a reaction to the diagnosis of the disease, disrepute and social effects caused by it. On the other hand, one of the most common disorders among these patients is anxiety disorders. Researches have reported the prevalence of this disorder between 22 to 47 percent in these patients [10, 11]. Among anxiety disorders, PTSD is the most common anxiety disorder in patients with HIV-AIDS. The prevalence of it is estimated between 10 to 74 percent [12, 13]. In addition, research has shown that HIV is associated with neuropsychological defects in attention, working memory, autobiographical memory and executive functions [14, 15]. The range of cognitive problems associated with HIV and AIDS fluctuate from changes in attention, executive function disorder to memory [3][4]. Given that many researches have reported high prevalence of mental health problems such as feelings of stress, depression, anxiety, post-traumatic stress and cognitive problems in people with AIDS [16] and since these psychological problems can weaken the immune system and accelerate the disease progression towards AIDS, it can also cause patient's noncompliance with medical prescriptions and failure of the treatment plan [17]. So having psychological intervention in patients with AIDS and equipping these patients with appropriate skills and strategies to cope with their disease is irrefutable. In this regard, many psychological interventions have been proposed and implemented, which mindfulness-based approach in recent years has attracted researcher's attention [18]. Mindfulness-Based Stress Reduction (MBSR) therapy is an example of this treatment approach. This method is a structural and group treatment that was originally used to manage chronic pain but nowadays is widely used to reduce the psychological complications of chronic diseases [19, 20]. The patients undergo a variety of mindfulness exercises (such as sitting meditation, body scan meditation, yoga, mind sympathetic meditation)[18]. This method of therapy was initially used to treat patients who suffer from chronic pain, but in recent years it is also proposed to reduce the symptoms of stress, anxiety and depression [21]. The research results suggest that MBSR therapy is an effective intervention for reducing chronic pain, cancer, cardiovascular disease, lower blood pressure, as well as the promotion of mental health and patents; quality of life[22-24].

Recent research in this area has paid attention to the effectiveness of training mindfulness-based stress reduction treatment on the psychological adjustment of

patients with chronic diseases including cancer, chronic pain, psychiatric disorders, cardiovascular disease and anxiety[25]. AIDS patients endure heavy psychological pressure, because in addition to the risk of death, they suffer from critical looks and others blaming them. They relatively receive less respect from others, therefore considering the current problems, these patients face psychological problems such as depression and anxiety. As so far no research in Iran has paid attention to this important fact, this study aimed to examine the effects of mindfulness-based stress reduction in the symptoms of depression, anxiety, mental distress and patient's autobiographical memory in patients with HIV-AIDS. Since this psychological problems can weaken the immune system and accelerate the progress in AIDS disease, it can also cause patients' noncompliance of medical prescriptions and failure of the treatment plan.

## Method

The present study is an experimental design with a pretest-posttest along with a control group. The study population consisted of patients with HIV-AIDS in two centers of Payamavarane Hamyari, and khanie khorshid. Using convenience sampling, 30 patients were selected and were assigned in the experimental and control group, randomly. Therefore, each of the experimental and control groups were included 15 people. The sample group were matched in terms of age, sex, marital status, education level and had similar social and economic conditions. After preparing the mindfulness-based stress reduction treatment manual, initial evaluation and selection of participants and assigning them to experimental and control groups, specific codes were identified for each one of them. The experimental group underwent 8 sessions of mindfulness-based stress reduction in the form of one session per week, each session lasting for 60 minutes. While the control group did not undergo any psychological intervention, they were only under the usual care of the center. They attended in the evaluation sessions of pre-test, post-test and follow-up. The inclusion criteria included a diagnosis of HIV-AIDS, agreeing to participate in the study with an informed consent and having minimum education. The exclusion criteria included other psychiatric disorders, seizure and neurological diseases.

*Beck Depression Inventory (Beck Depression Inventory-II):* The Beck Depression Inventory is a revised questionnaire form which is edited to assess the severity of depression. It contains 21 items which the subject in each item chooses one of the four options which represents the severity of depression[26]. This questionnaire has a correlation of 71.0 with a Hamilton Rating Scale Questionnaire, its one-week test-retest reliability is 91.0 and the internal consistency of the questionnaire is reported to be 91.0. The psychometric properties of the questionnaire in a sample of 94 people in Iran is reported as follows: The alpha coefficient was 91.0, the correlation coefficient between the two halves, 89.0 and the retest coefficients within a week, was 94.0 [27].

*Beck Anxiety Inventory (Beck Anxiety Inventory):* Beck Anxiety Inventory with 21 item, is a self-report instrument for measuring the severity of anxiety. Four options of each question in a four-part range are scored from zero to three. The total score of this tool is placed in the range of 0 to 63. In a study which Kavyani and Mousavi carried out on the Iranian population (150 patients with clinical anxiety), the validity and reliability of the questionnaire was reported to be 0.72 and 0.92 [28], respectively.

*Impact of Event Scale-Revised (IES -R):* This scale is a self-rating scale which contains 22 items in order to assess the mental retardation when faced with certain events in life consistent with DSM-IV criteria which is made for PTSD diagnosis. The questionnaire is scored from never (0) to severely [4]. The total score of 22 items determines the total score of the test. The general score of IES -R includes the total score of 3 subscale scores of avoidance, unwanted thoughts and arousal. The alpha coefficient for unwanted thoughts is reported to be between 87.0 and 92.0, between 84.0 and 86.0 for avoidance, and between 79.0 and 90.0 for hyper arousal. Also for test-retest reliability, it is reported to be 57.0 for the subscales of unwanted thoughts, 51.0 for avoidance, and 59.0 for hyper arousal[29].

*Mindfulness-Based Stress Reduction:* Mindfulness-based stress reduction therapy is an 8-week treatment,

each session lasting 2 to 2.30 hours [30]. This treatment was performed in a form of a group. The experimental group underwent mindfulness-based stress reduction intervention and the control group remained waiting for treatment. The general framework of 8 sessions of mindfulness-based stress reduction treatment is as follows.

**Results**

The findings of this test was based on the pre-test, post-test and follow up about evaluations conducted from variables of depression, anxiety and the impact of the event. The mean and standard deviation of the subject scores of the two groups in pretest, posttest, and follow-up sessions in Beck Depression Inventory, Beck anxiety Anxiety Scale and the revised impact of the event is shown in Table 2. Also, the results of the mixed analysis of variance is shown in Tables 3 and 4.

As the findings of Table 2 show, there is a difference between the dependent variable in the mean of the two groups at different times of performance. So for studying the difference of means and hypothesis testing, regarding the three stages of measurement in the both groups and also several dependent variables, the mixed multivariate analysis of variance was used. The results are as follows.

**Table 1.** The content of mindfulness- based stress reduction therapy sessions

sessions	The content of sessions
first	Greeting/Introduction, depression description, introducing the logic of treatment, autopilot, communication and conceptualization of the need to use mindfulness, giving description of the autopilot.
second	Facing obstacles, reviewing last week’s task, giving feedback and discussion about body scan, practicing mindfulness meditation, breathing exercises.
third	Being mindful of breathing: reviewing last week’s homework, sitting meditation practice, reviewing tasks, practicing 3 minutes of breathing space
fourth	Staying in the present: Reviewing last week’s task, practicing breathing, seven minutes practice of “seeing or hearing”, again practicing mindful breathing and body scan.
fifth	Permission/ license to attend: reviewing last week’s tasks, breathing exercises, meditation sitting (awareness of breathing, body, voice, and thoughts), clarity about stress and its relationship to pain, investigating one’s knowledge of pleasant and unpleasant events on feelings, thoughts and body sensations.
sixth	Thoughts are not facts: reviewing last week’s tasks, mindful yoga, discussing the difference about seeing thoughts differently or thoughts successor, sitting meditation (mindfulness of sounds and thoughts).
seventh	How can I best take care of myself: reviewing last week’s tasks, sleep hygiene, repeating last session’s exercises, making a list of enjoyable activities of the session.
eighth	Acceptance and change: Reviewing last week’s tasks, practicing body scan, conclusions of sessions, inquiring and discussion about programs and continuing the practicing of the tasks; preparation for the termination ending.

**Table 2.** Descriptive statistics of scores of Beck Depression, Anxiety and the impact of the event

Group	Variable	Pretest		Posttest		Follow up	
		M	SD	M	SD	M	SD
Experiment	Depression	23.53	6.18	13.07	4.72	14.53	5.09
	Anxiety	22.13	5.84	12.67	3.61	13.33	4.57
	Impact of the event	20.56	5.52	13.93	4.23	15.08	4.89
Control	Depression	24.20	6.65	23.33	5.39	22.89	6.21
	Anxiety	22.47	5.53	23.27	6.11	22.84	5.49
	Impact of the event	21.64	6.08	21.89	5.79	20.93	5.30

**Table 3.** The summary of the result of different multivariate tests

Effect	Test	Value	F	Sig	Partia Eta squared
Time	Wilks lambda	0.81	21.68	0.001	0.91
Group* time	Wilks lambda	0.88	27.15	0.001	0.93

**Table 4.** The results of mixed ANOVA

Source	Measure	SS	DF	F	sig	Partia Eta squared
Group	Depression	1054.04	1	39.68	0.001	0.85
	Anxiety	1020.10	1	15.16	0.01	0.60
	Impact of the event	384.40	1	8.30	0.01	0.23

In Table 3, the results of the analysis of the variance test for studying the main, interactive and time-consuming effect of variables are listed. The Wilks Lambda for time is 81.0 which is significant at ( $F = 21.68$ ,  $P < 0.001$ ) level. Therefore, we can conclude that there is a significant statistical effect on time. This reflects the fact that there is a significant difference between the scores of the dependent variables in all three stages of time. In addition, the Wilks Lambda value is 88.0, which is significant at ( $F = 27.15$ ,  $P < 0.001$ ) level. This suggests that no similar changes has occurred in the dependent variable scores between the two groups, over time. This means that from the pretest to the follow-up in two groups of experiment and control there is a significant difference which indicates the effectiveness of the treatment program on the dependent variables in the experimental group.

To assess the independent effects between the subjects (the experimental and control group), the between-group effects were used. The between-group effect on dependent variables is documented in Table 4. As it can be seen, there is a significant difference between the two groups of experiment and control in all the dependent variables ( $P < 0.05$ ). So it can be concluded that there is a significant difference between the two groups in the scores of the dependent variables, in the post-test and follow-up, suggesting the efficacy of treatment in the experimental group compared to the control group. So we can say that there is a significant difference between the experimental and control groups in depression, anxiety, impact of the event, in the semantic and episodic memory.

## Discussion

The current study was conducted with the aim of examining the effect of mindfulness-based stress reduction in symptoms of depression, anxiety and post-traumatic stress in patients with HIV-AIDS. The results indicated that mindfulness treatment is significantly effective in reducing the symptoms of depression, anxiety, and post-traumatic stress in patients with AIDS. The conducted research is in line with the research findings in the field of mindfulness-based stress reduction therapy in reducing the symptoms of depression, anxiety and post-traumatic stress in chronic patients [20, 24, 25, 31-35]. In explaining the fact that mindfulness stress reduction treatment reduces depression in patients with HIV-AIDS, It can be noted that the factors that contribute to depression in patients with AIDS is not the disease experience, but it is the patient's attitudes, beliefs and expectations of the disease that is associated with higher rates of depression among them. Cognitive distortions like catastrophizing, helplessness and patient's evaluation of the disease diagnosis, and the control that the patient

imagines for oneself, pain and the amount of control on that, their interpretation over pain and its consequences and overall cognitive system and pain-related beliefs is associated with depression in them [36]. We could also consider since mindfulness and its training can cause feelings without judgment and raise emotional, mental and physical awareness, it can also help to clearly see and accept emotional and physical phenomena, as they occur, so it can play an important role in the modification of depression scores in patients with HIV-AIDS. In other words, we can say that the treatment of mindfulness based stress reduction can cause patients with AIDS- HIV to accept related psychological problems such as depression and reduce their negative feelings about the psychological effects of AIDS through positive retrieval [20, 37]. Due to the fact that the individual's mood is directly connected with his/her thought patterns and that negative thinking and its dysfunction can cause negative moods and negative physical effect, so HIV-AIDS patient's mood is associated with unpleasant and negative thoughts. Thus, mindfulness-based stress reduction treatment will help patients with HIV-AIDS to rebuild their patterns of negative thinking about one's illness, including depression and replacing negative thoughts with positive methods so that it can reduce depression. Results also indicate the effectiveness of mindfulness-based stress reduction therapy in reducing anxiety in patients with HIV-AIDS. To explain these findings, it can be said that the mindfulness-based stress reduction in patients with HIV-AIDS is taught in a way to accept and approve every single thought, emotion or bodily sensations that enters their attention. This protective response against negative thoughts and feelings helps patients to immediately reach equilibrium after previous experiences of negative emotions [37]. Since mindfulness exercises increase the tolerance of negative emotions and the upsetting bodily sensations in this disease, it also helps them release themselves from negative automatic thoughts, habits and unhealthy behavioral patterns, therefore it plays an important role in the emotion regulation [38]. Researchers also believe that emotions and physiological states can cause more anxiety and provide false evidence for making patients anxious. When this condition occurs, the patient responds with more agitation, avoidance, emotional collapse and this issue will eventually aggravate anxiety in the individual (Rosenberg, 2009). Therefore, the first step in helping people who have symptoms of anxiety is to stop the cycle of anxiety and then change anxiety by replacing new habits and skills based on increasing self-esteem and relaxation methods such as mindfulness [31]. Since it has been mentioned in numerous studies that MBSR techniques are involved in reducing the symptoms of physical stress, reduced physical symptoms of recalled

anxiety in patients with AIDS is tenable. In addition, the results indicated the effectiveness of mindfulness-based stress reduction therapy in reducing post-traumatic stress syndrome in patients with AIDS. To explain these findings, it can be said that mindfulness-based stress reduction treatment with regard to the relationship between mind and body helps the patients with AIDS to deal with the disease in a more skillful way. Thus, by reducing stress and psychological pressure they cultivate a good sense of self as a complete person against their damage [39]. In fact, this treatment uses mindfulness techniques to reduce stress and panic in those patients which eventually leads to a significant improvement in sleep mode, stopping negative thoughts and replacing them with positive thoughts, reducing insomnia, fear, and shock in patients with AIDS. This problem leads to more hope in these patients and reduces the damages after the diagnosis of the disease. Since mindfulness-based stress reduction therapy has reduced the symptoms of depression and anxiety in patients with HIV and given the fact that cognitive disorders such as memory weakness are prevalent in patients with depression and anxiety [40], this study faced a few limitations. One of these limitations included the implementation of mindfulness-based stress reduction treatment only on samples of men suffering from AIDS, which may limit the generalizability of the findings.

## Conclusion

According to the results of this study, that mindfulness-based stress reduction therapy significantly reduced the symptoms of depression, anxiety and post-traumatic stress in the experimental group compared to the control group. It seems that this treatment will have a significant effect on psychological functioning of patients with HIV-AIDS; so paying attention to the findings and the mechanism of its efficacy can have a good therapeutic implications in reducing the psychological disorders of people with HIV-AIDS.

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