



Effectiveness of Mindfulness-Based Cognitive Therapy on Sleep Quality and Perceived Social Support Improvement in Patients with HIV/AIDS

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Abstract

Background: Human immunodeficiency virus (HIV/AIDS) is the factor causing AIDS. The virus is categorized into retroviruses that attack and destroy the immune system of the body and cause lethal infections.

Objectives: The present study aimed to investigate the effectiveness of mindfulness-based cognitive therapy in the improvement of sleep quality and perceived social support of the patients with HIV/AIDS.

Methods: The present study is randomized controlled trial research. The study population included individuals with HIV/AIDS from Ahvaz county's center of behavioral disease counseling. The study sample volume consisted of two groups, named mindfulness-based cognitive therapy and control groups, each one contained 15 individuals who were selected randomly. The experimental intervention was undertaken during eight 1.5-hour sessions that were held once a week. To gather the data, the sleep quality scale, perceived social support questionnaire, SCL-90-R scale, and demographic factors questionnaire were used. Multivariate covariance analysis and SPSS-22 Software were utilized for analyzing the data.

Results: In terms of gender, the experimental group consisted of 8 (53.3) women and 7 (46.7) men. In the control group, 4 (26.7) were women and 11 (73.3) were men. The mean (standard deviation) age of the participants in the experimental group was 35.7 (7.42) and the mean (standard deviation) of the age of the control group was 37.8 (9.1). The results showed that mindfulness-based cognitive therapy had a significant effect on sleep quality ($F = 27.98, P < 0.001$) and perceived social support ($F = 36.20, P < 0.001$) in patients with HIV/AIDS.

Conclusions: It can be concluded that mindfulness-based cognitive therapy is effective in improving the sleep quality and perceived social support of patients with HIV/AIDS. Based on the results of this study, it seems that by teaching mindfulness-based cognitive therapy, patients' sleep quality and perceived social support can be reduced.

Keywords: Mindfulness, Sleep Quality, Perceived Social Support, HIV/AIDS

1. Background

Human immunodeficiency virus (HIV/AIDS) is the leading cause of AIDS. The virus is categorized into retroviruses that attack and destroy the immunity system of the body and cause lethal infections (1). The human immunodeficiency viruses, called HIV1 and HIV2, are cytopathic (2). The individuals with HIV exhibit symptoms like fever, sweating, shivering, inflation of the lymphocytic glands, asthenia and atrophy, weight loss, chronic diarrhea, blindness, extreme fatigue, and sleep disorders and CD4 reduction. Infliction with HIV/AIDS makes individuals susceptible to various cancers like sarcoma Kaposi, cervix cancer, and

lymphoma (3).

The disease is also known to result in neurological entanglement. It causes preliminary signs such as CNS deficiencies, depression, amnesia, loss of concentration, consciousness reduction, apathy and decline in the tendency towards sexual relations and leads to dizziness, balance disorder, convulsion, advanced dementia, and coma (4). The researchers have figured out in a review study of four articles till 2015 that the physical activity of the patients with HIV/AIDS is significantly associated with sleep quality of this special group and performing physical activities increases their quality of life (5). One of the other important variables is social support, which is enumerated amongst

the essential needs of individuals with HIV/AIDS. The individuals afflicted with this virus, in a way or another, should be able to have a good life and sustenance.

Meanwhile, families and society can provide these individuals with the ability to live along with others through social and psychological support (6). The researchers have found out that favorable results would follow the interventions for improving the psychological health of individuals with HIV if they are performed through taking into account the strategies of preventing blaming and stigmatizing and strengthening social support. The effective support of the family and society level elevate the perceived social support (7).

Lack of social support is another important issue that has to be taken into consideration in individuals with HIV/AIDS, and it can leave adverse effects and result in anxiety, depression, sadness, feeling guilty, reduction in hope in life, more limitations in social networks, losing job and losing income in the infected individuals (8). Research showed that 56.5% of the individuals with HIV/AIDS are provided with weak social supports, and the married persons who are socially more supported tend to use a condom more in their marital relations than the married couples deprived of social support (9). Thus, the social support of the HIV-infected persons should be elevated through informing and instructing their families so that the possibility of the society's infection with HIV can be reduced. Low et al. (10) figured out that the social stigma reversely correlated with the family's social support of the individuals with HIV/AIDS and no gender differences were controlled in this regard. Therefore, the change in the policy-making aiming at the elevation of the family's quality and quantity of social support can strengthen the protective effects of the family's social support in preventing and reducing the social stigmatization of patients with HIV/AIDS. In the course of studies on the social support and general health concerns of the patients with HIV/AIDS compared to the healthy individuals in Shiraz.

Ironson et al. (11) figured out that there is a positive and significant relationship between general health and social support of the infected persons, and that the general health of the HIV-infected persons is lower than their normal counterparts. Furthermore, they are usually found with physical problems, anxiety, insomnia, and depression. However, there has been no study in this area in Iran. According to what was mentioned and the difficulty in the clinical management of people with HIV, the psychoeducational interventions (non-drug) could be a good therapeutic option for reducing their psychological discomfort (7). However, it seems that the necessity of paying attention to this issue is more prominent in women. Because, in spite of very effective treatments to control HIV, the mortality rates

in women with HIV are alarmingly high and this shows the importance of paying more attention to them. Thus, in order to address this research gap and the need to modify the quality of life in these cases, it is necessary to conduct such a study. Therefore, the present study examined the effectiveness of mindfulness-based cognitive therapy in improving the sleep quality and perceived social support of patients with HIV/AIDS.

2. Methods

The present study is a randomized controlled trial. The study population included patients with HIV/AIDS who have been subjected to anti-retrovirus treatment in Ahvaz's center of behavioral disease counseling. Out of the study population, 30 individuals were selected by simple randomized sampling and assigned to two groups, namely experimental and control. The data were collected based on a field study method using documentation, observation, and personal interviews. The study was carried out on 30 patients (in one experimental group (15 persons) and one control group (15 persons) with HIV/AIDS from the behavioral disease counseling center in Ahvaz. The questionnaires were distributed between the patients with HIV/AIDS having the following the inclusion and exclusion criteria as well as after doing clinical interviews. The inclusion criteria were age range of 25 to 50; residence in Ahvaz; minimum junior high school degree; ability to fluently speak Persian and minimum CD4 score below 350. The exclusion criteria consisted of having a record of diseases such as depression and psychotic disorders and other comorbidities; taking neurological drugs, and having an addiction and suicidal thoughts. Ethical considerations included the following: completion of the questionnaire without their name on it. The importance of the research topic was explained to the participants in this research and their interest and belief were attracted to participate in the study. The participants could withdraw from the project if they did not like to cooperate. All of them were assured that their personal information would be confidential. This study was approved by the Ethics Committee of Islamic Azad University of Ahvaz with code number IR.IAU.AHVAZ.REC.1398.003.

At the beginning of the work, an agreement was obtained from the Healthcare Vice-chancellor of Ahvaz. All of the patients with HIV/AIDS were identified and allowed to enter the study. The data-gathering instruments were a demographic questionnaire, SCL-90-R questionnaire, sleep quality questionnaire, and perceived social support questionnaire. A healthcare psychologist collected the data, and the study participants were asked to attend a debriefing session about how to complete the questionnaires in

the counseling center one week before data collection. The study participants were subjected to mindfulness-based cognitive therapy instruction at least in eight weeks. The required coordination was made with the behavioral diseases counseling center through a phone call regarding the holding of the mindfulness-based cognitive therapy sessions in a group. The patients took part in eight sessions after they had been assigned to the intended treatment group. The sessions lasted 45 minutes and were held in eight weeks in the counseling center. Before initiating the sessions, a debriefing session was held for the members of each group, and the participants were provided with explanations regarding the treatment group. Meanwhile, explaining the study conditions and introducing the researcher, written informed consent form was signed before participation in the study. The participants were asked to complete the questionnaires in the course of treatment and instruction (Table 1).

2.1. Pittsburgh Sleep Quality Index (PSQI)

This questionnaire has been constructed to investigate the sleep quality during the past month and contains 18 expressions. A large number of the studies performed in this area show a high validity and reliability of this questionnaire (12). It is asserted that the questionnaire distinguishes the quality of good sleep from that of bad sleep (0.36). Each of the sevenfold scales in the questionnaire has a reliability coefficient (Cronbach's alpha) and an internal consistency of about 0.83 and 0.36, respectively. The questionnaire features a suitable sensitivity for distinguishing the subjects with good sleep quality from those with bad sleep quality in a range from weak to strong. Each of the seven subscales of this questionnaire is scored in a range from zero to three (0 = none, 1 = weak, 2 = medium, and 3 = extreme). The total score of the questionnaire ranges from zero to 21. The higher scores are reflective of poor sleep quality. The total scores above 5 are indicative of the subjects with poor sleep or severe problems, at least in two areas or intermediate problems in more than three areas (12). The reliability of the questionnaire in the present study was 0.80.

2.2. Perceived Social Support Questionnaire

The multidimensional perceived social support scale was designed in 12 articles by Zimet in 1988, and it measures the support of family (four items), friends (4 items), and important others (4 items). The articles are assessed on a five-point Likert scale (from 1 = completely disagree to 5 = completely agree). The minimum and maximum attainable scores range from 60 to zero, with higher scores being reflective of the idea that an individual is socially

well-supported. Numerous studies show that this scale enjoys excellent internal consistency and retest. Mitchel and Zimet have found the among other things, Cronbach Alpha coefficient equal to 93% for the multidimensional social support scale (the 12-item version) in whole and values equal to 0.91, 0.89 and 0.91 for social support of family, friends, and significant others, respectively. They have also obtained similar coefficients for a girl and boy adolescents, as well as for African-American and European-American races, 0.85 was reported for social support by friends of the African-American men, and 0.95 was found for social support by the family of the European-American men (13). Cheng and Chan acquired Cronbach's alpha coefficients equal to 0.99, 0.78, and 0.76 correspondingly for social support by important others, family, and friends, respectively. Cronbach's alpha coefficient has also been calculated in the other studies for social support of family, friends, and important others with values ranging from excellent to satisfactory (14).

2.3. SCL-90 Scale

This questionnaire investigates the intensity of the common psychological signs and complaints through 90 questions for each of which there are five options from none (zero) to intensive (4). The questionnaire has nine dimensions and three indices. The nine dimensions of this test are (1) physical complaints; (2) obsessive-compulsive disorder; (3) interpersonal sensitivity; (4) depression; (5) anxiety; (6) aggression; (7) phobia; (8) paranoid thoughts; and (9) psychosis. The three indices are (1) general disease index; (2) positive symptoms; and, (3) positive signs' intensity index (15). The test-retest reliability of the scale has been reported in a range between 0.77 and 0.90. The test's validity has been reported satisfactory on the groups of patients with psychological and physical diseases as well as on the individuals under high psychological pressure conditions (15). In Iran, the test's internal consistency has been reported based on Cronbach's alpha in a range from 0.77 for the psychosis aspect to 0.90 for the depression aspect. The retest reliability of the questionnaire ranges from 0.80 for physical complaints to 0.90 for paranoid thoughts (16).

2.4. Statistical Analysis

Multivariate covariance analysis was used to analyze the data by SPSS-22 software. Kolmogorov-Smirnov was used to analyze the normality of the data. To investigate the significance of the difference between the scores of sleep quality and perceived social support in mindfulness and control groups, multivariate covariance analysis was done.

Table 1. HIV/AIDS Treatment Sessions with Mindfulness Contents

Session	Session's Content
Pretest session	Establishing a relationship, trust, and mutual understanding; making the participants familiar with cognitive therapy; investigating the participants' experiences, abilities, treatment history, current support; interviewing with the patients; distributing biography papers; setting a day and time for a treatment session
First session	Holding pretest; conceptualization and planning for treatment; instructing patients about MBCT; introducing HIV/AIDS; showing slides and making familiar with mindfulness-based cognitive behavioral therapy model; treatment process; showcasing a normal visage of the participants' problems and filling them with hope; determination and identification of the participants' expectations of treatment; discussing about how thoughts influence dispositions; introducing a three-minute breathing exercise
Second session	Complete introduction about HIV/AIDS and its effect on the body; introducing MBCT treatment; continuing meditation and breathing exercise and acquiring an awareness of various body parts' feelings; introducing mindfulness as a method for stopping automatic processes; scanning or inspecting the body
Third session	Continuing meditation and breathing exercise; expressing the negative thoughts and emotions and substituting them with positive ones; scanning the body; contributing to the patients in selecting a problem or a goal for concentration; making participants more familiar with mindfulness-based cognitive therapy and depression test
Fourth session	Continuing meditation and breathing exercise for three minutes; showing slides of various styles of communication along with general encouragement; coping with HIV/AIDS disease; Yoga exercises; expanding the social support network and empowering the individuals for performing concentration and mindfulness
Fifth session	Continuing meditation and breathing exercise; relaxation; paying attention to feelings and thoughts; body scanning; investigating stress and anxiety and the sleep status; metaphor therapy; emphasizing on the importance of the supportive networks
Sixth session	Continuing meditation and breathing exercise; investigating the cycle of the negative thoughts and substituting them with positive thoughts; light communication exercises; concentration on the body's senses and feelings; focusing on success in life and work
Seventh session	Continuing breathing and meditation exercises; teaching mindfulness; using mindfulness exercises; coping strategies; action visualization; the importance of the dietary regime
Eighth session	Preparation for ending the treatment and a review of HIV/AIDS

3. Results

The descriptive findings of the present study included statistical indices like mean, standard deviation, and the number of tests in the study sample volume as well as frequency and percentage tables, all of which have been presented for all of the studied variables in [Tables 2 and 3](#).

As it is seen in the [Table 2](#), the three studied groups possess identical distribution in both control and experimental levels since the significance level is larger than 0.05.

According to the results obtained from Kolmogorov-Smirnov test and because P value computed for the study variables is not significant at 0.05 level, it can be concluded that the distribution of the data related to the study hypotheses is normal, so it is possible to use covariance analysis test. Before performing the variance analysis through repetitive measurements, the results of Box's M and Levin tests were investigated to ensure that the presumptions hold. Since Box's M test did not produce significant results for any of the variables ($P > 0.05$; $df = 20$ and Box's $M = 23.98$), the homogeneity condition of variance-covariance matrices has been correctly observed. Moreover, the insignificance of all of the variables in the Levin test is indicative of the equality of the variances between the groups; hence the equality of the dependent variable's error variance in all of the groups.

As is observed in the [Table 4](#), all the tests are significant at 0.001 level, and this is indicative of the idea that

there is a significant difference between the mindfulness and control groups in terms of sleep quality and perceived social support. It is worth mentioning that Wilk's lambda, with a value equal to 0.23 and F-test with a value equal to 16.86 represent a significant difference between the mindfulness and control groups in terms of sleep quality and perceived social support ($P < 0.0001$).

The results of [Table 5](#) are suggestive of the idea that the sleep quality (27.98) is significant at 0.001 level, and perceived social support (36.20) is significant also at 0.001 level. So, it can be stated that the mean sleep quality and perceived social support values are significantly improved in the mindfulness group at the end of the posttest in comparison to the control group ($P < 0.01$).

4. Discussion

The present study aimed at determining the effectiveness of mindfulness-based cognitive therapy in improving sleep quality and perceived social support in patients with HIV/AIDS from Ahvaz. The study findings indicated that there is a significant difference between the mindfulness and control groups in terms of sleep quality (27.98) and perceived social support (36.20) at 0.001 level. It can be stated that the mean sleep quality and perceived social support have been improved in the mindfulness group, as controlled in the posttest in contrast to the control group

Table 2. Frequency Distribution and Comparison of the Demographic Characteristics^a

Demographic variables	Mindfulness	Control	P Value
Gender			0.332
Female	8 (53.3)	4 (26.7)	
Male	7 (46.7)	11 (73.3)	
Marital status			1.0
Single	1 (6.7)	1 (6.7)	
Married	14 (93.3)	14 (93.3)	
Age			0.437
Below 30	1 (6.7)	0 (0.0)	
30 - 39	7 (46.7)	10 (66.7)	
40 - 49	7 (46.7)	5 (33.3)	
Education			0.080
Illiterate	1 (6.7)	0 (0.0)	
Below diploma	13 (86.7)	14 (93.3)	
Associate's degree	0 (0.0)	0 (0.0)	
BA	1 (6.7)	1 (6.7)	
Employment status			0.117
Housewife	0 (0.0)	6 (40.0)	
Self-employed	6 (40.0)	8 (53.3)	
Employee	9 (60.0)	1 (6.7)	

^aValues are expressed as No. (%).

($P < 0.01$). Although the critical feature of HIV/AIDS is the gradual decline in the body's ability to exhibit cellular immunity responses in relation to the corresponding medical symptoms, the nervous-psychological phenomena are also vividly observed (17). The studies have shown that the individuals with HIV/AIDS suffer more than the general population due to the disease symptoms and difficulty of controlling the disease for reasons such as anxiety, distress, and low sleep quality, and the researchers have supported the effectiveness of mindfulness-based cognitive therapy in reducing the anxiety symptoms and elevating the sleep quality (18).

This treatment program can be an effective psychological-social intervention for improving the symptoms such as depression, anxiety, stress, and sleep quality (19). The effectiveness of mindfulness-based cognitive therapy in improving the general status of patients with HIV/AIDS has been demonstrated in various studies that are consistent with what has been found herein (20). It has been shown by the researchers that there is a significant relationship between the mindfulness-based exercises and levels and medical and psychological as well as general wellbeing levels in mindfulness-based

treatment. Researchers (21) have also indicated that performing mindfulness meditations significantly increases mental clarity and mental health and reduces physical tension and improves sleep quality in the patients. They have concluded that mindfulness-based cognitive therapy plays a vital role in the recovery and improvement and positive outcomes are evident following the participation of the subjects in the treatment program. Mindfulness-based cognitive therapy is effective in managing and mitigating the disease symptoms and improving sleep quality in the patients (22). Scott-Sheldon et al. (23), Wood (24), and Witek-Janusek et al. (25) demonstrated that mindfulness is effective in enhancing the health and quality of life and reducing stress in individuals with HIV/AIDS as documented in the follow-up test after the treatment. The effectiveness of mindfulness-based cognitive therapy has also been confirmed in other studies, indicating that it improves sleep quality and reduces psychological symptoms like depression and anxiety (23).

Mindfulness-based cognitive therapy intervention is described as an available method for reducing the sufferings and expanding positive qualities like consciousness, insight, wisdom, and sympathy (26). It is also helpful to extensively instruct relaxation, and it is intensively emphasized that it as a valuable stress-coping skill that has to be regularly utilized in every individual's life and as a stable part of the individuals' coping skills (27). The mindfulness method can also be used for assisting the patients in attaining a method for resisting mental rumination and central self-evaluation to bring about perceivable changes in the individuals' current status and reach the optimal dispositional status (28). It can also be stated to elucidate the effectiveness of mindfulness-based cognitive therapy that this treatment helps the patients cope with a vast spectrum of symptoms, and such a coping and adaptation with the conditions significantly results in the recovery and improvement (29). Mindfulness-based cognitive therapy not only shifts the attitudes of the patients with HIV/AIDS from negative towards positive, but it also decreases their reactivity and impulsiveness. It also improves the self-care level and perceived social support in these patients and elevates the socialization level and establishment of communication with others (30). The mindfulness-based stress reduction program enhances the adaptation and endurance power, creates a sense of hopefulness, and causes more positive responses to develop the treatment; hence, more treatment outcomes are obtained (31).

It can be stated in the elucidation of this finding that the patients' stress is more of a mental and cognitive nature and, because the individuals in this treatment method are taught to experience and be in the present time, they will be temporarily relieved of their attitudes and beliefs

Table 3. Central Indices and Discrepancy of the Cognitive Therapy/Behavioral Treatment Group's Scores Regarding CD4 Increase in the Patients with HIV/AIDS

Group	Number	Mean	Standard Deviation	Mean	Standard Deviation
Sleep quality					
Control	15	11.40	5.57	11.13	3.75
Mindfulness	15	10.93	4.13	4.93	2.21
Social support					
Control	15	36.93	10.80	35.46	6.71
Mindfulness	15	36.13	14.30	49.40	6.50

Table 4. Results of Multivariate Covariance Analysis

Test's Name	Amount	F-Test	Hypothesis's df	df Error	P Value	Eta ²	Test Power
Pillai effect	0.76	16.86	2	23	0.001	0.76	0.76
Wilk's lambda	0.23	16.86	2	23	0.001	0.76	0.76
Hotelling's trace	3.21	16.86	2	23	0.001	0.76	0.76
Roy's largest root	3.21	16.86	2	23	0.001	0.76	0.76

Table 5. Multivariate Covariance Analysis for Comparing Pretest and Posttest in Experimental and Control Groups

Effect Source	SS	df	MS	F	P Value	Eta Square
Sleep quality	288.10	1	288.10	27.98	0.001	0.53
Perceived social support	1379.03	1	1379.03	36.20	0.001	0.60

that are rooted in their past and influenced by their future fears and worries. Furthermore, this attitude is created in them that they should accept all the things (pleasant and unpleasant) without any prejudice (32). The high levels of mindfulness positively correlate with high levels of positive affections, regular and normal dispositional expectations, and self-acceptance and negatively correlate with depressive disorders (22). It has been shown in the studies that this treatment helps improve the distressing emotions and regulation of them in patients with HIV/AIDS (3). Therefore, it can be concluded that mindfulness-based cognitive therapy can reduce perceived stress and the patients' defective patterns so it can be applied independently or along with other treatment methods like medication to improve the psychological and behavioral problems stemming from sleep quality (33).

The limitation of the present study is the small number of samples that can reduce the possibility of generalizability and inaccessibility of the individuals with HIV/AIDS, and shortage of researches on the effect of mindfulness treatment on sleep quality in our country can be pointed out. Based on the results, we can suggest (1) healthcare and treatment officials and corresponding physicians should pay more attention to the holding of strategic mindfulness instruction workshops for patients with HIV/AIDS and

(2) implementation of interventional mindfulness programs; attention control instruction; time management; performing exercises to correct the disorders and disruptions; changing the patients' attitudes and discretions regarding the disease; performing home assignment and learning correct and effective coping strategies regarding how to face the life's stressful accidents like disease and incidents related to them to bring about happiness and cheerfulness in the individuals' performing daily activities.

4.1. Conclusions

It can be concluded that mindfulness treatment is effective in sleep quality and perceived social support in patients with HIV/AIDS. Mindfulness-based interventions employ a slightly different model of cognitive therapy that emphasizes the importance of non-attachment to self as well as to psychological and somatic symptoms.

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Footnotes

Authors' Contribution: Study concept and design: Shahla Molavi and Naser Seraj Khorrami; analysis and interpretation of data: Parvin Ehteshamzadeh; drafting of the manuscript: Shahla Molavi; critical revision of the manuscript for important intellectual content: Shahla Molavi; statistical analysis: Naser Seraj Khorrami.

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