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Research Article

Evaluation of the Effect of Cognitive-behavioral Therapy on Adherence to Treatment and General Health in HIV Positive Patients

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Abstract

Background and Objective: The aim of this study was to evaluate the effect of cognitive-behavioral therapy on adherence to treatment and general health of HIV positive patients.

Method: In a quasi-experimental design, 30 HIV positive patients referred to Imam Khomeini Hospital for treatment were randomly selected, and then, they were randomly assigned into two groups of the experiment (n = 15) and control (n = 15). Pre-test was performed for both groups before intervention. The experimental group received 12 sessions of cognitive-behavioral therapy, 1 session per week, but the control group received no intervention. Then, both groups completed post-test and finally, both groups completed the research questionnaires after 3 months (3 months follow-up). Data were collected using the General Health Questionnaire (GHQ 28) and Modanlou Adherence to Treatment Questionnaire. The collected data were analyzed by covariance analysis.

Results: The results showed a significant difference between experimental and control groups in terms of adherence to treatment and general health in the pre-test, post-test and follow-up stages ($P < 0.05$).

Conclusion: The results of this study suggest that cognitive-behavioral therapy can improve adherence to treatment and general health in HIV positive patients.

Keywords: HIV positive, Cognitive-behavioral therapy, Adherence to treatment, General health.

Background and Objective

AIDS was first seen in 1981 and was identified in 1983[1]. In 2015, more than 36 million people were living with HIV. Each year, 2.1 million people are infected with it, indicating a reduction in its infection rate[2.] South African countries have the highest HIV prevalence in the world. Approximately, 70% of infected people are living in this region[3]. Although the Middle East and North Africa region are amongst the least infected regions in the world, Iran has the highest number of people infected with this disease compared to other countries of the region[2].

Based on the official statistics provided by the National Center for AIDS Prevention on January 14 of 2013, a total of 27416 HIV / AIDS patients have been identified, 89% of whom are male. Among them, 5428 had AIDS and the rest had HIV infection[4] .

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. Chronic diseases depend to a large extent on adherence to treatment[5]. Various factors such as low literacy[6] poverty[7], lack of support by family and friends[8], stress[9,10], depression[11] can affect adherence to treatment and disease progression. North American and European studies suggest that people with HIV often suffer from depression and anxiety disorders[12]. Depression rate in adults infected with HIV is between 22% and 32%, which is twice that of the general population. About 50% to 80% of people with HIV are exposed to specific symptoms of HIV similar to anxiety symptoms. HIV-related symptoms increase anxiety symptoms[13], which in turn can increase HIV symptoms[14]. Increased anxiety is significantly associated with fatigue[15] and lower physical performance in males with HIV[16]. Psychological variables are crucial in understanding the patients response to challenges related to chronic medical problems. It has been shown that cognitive-behavioral stress therapy affected factors such as social support, mood, and coping in promoting adherence to treatment for people who were living with HIV[17]. Empirical support in a range of medical specialties, not merely oncology, including gastroenterology, infectious diseases, endocrinology and cardiovascular disease suggests that the cognitive-behavioral approach can provide psychological symptoms and discomfort and improve the quality of life and management of a disease[18].

Method

This research was a quasi-experimental study with two groups of experimental and control with pre-test, post-test and 3-month follow-up. The research population included all HIV positive patients referred to Imam Khomeini Hospital in Tehran during one week from 2018.2.9 to 2018. 2.16. In this research, convenient sampling method was used. By referring to the Hospital Infectious Disease Ward and with advice of one of the medical staff, patients who were routinely referred to the clinic for medical treatment were justified to participate in the research. After obtaining their consent, they were ensured that their information would remain confidential. They were invited to researcher counseling center to participate in the Cognitive-Behavioral Therapy Program and to complete the questionnaire.

The research inclusion criteria included all those diagnosed with HIV-positive and taking medication, no personality disorder, age range of 18 to 60 years, diploma level of education, and not registering for other psychotherapy or other therapy program at the current time. The research exclusion criterion also included absence in more than four sessions. Each patient was treated with cognitive-behavioral therapy by the therapist weekly based on a book entitled Cognitive-Behavioral Therapy of Chronic Medical Diseases written by Creek and White. The consent of 52 of them was taken to participate in the study. Then, they were randomly divided into two experimental and control groups. The experimental group participated in psychotherapy sessions and the control group received no intervention. After implementing the SCID-II questionnaire, 4 of them were excluded from treatment. During the implementation of the study, 9 members of the experimental group were excluded from the study due to the absence in more than four sessions. Additionally, 9 members of control group were excluded from the study due to match the number of members of two

groups for more detailed analysis. The sample consisted of 30 patients divided into two groups (each group contained 15 patients). At the end of the period, the two groups were re-tested. Then, both groups were followed up for a three-month period and the research tests were performed. After analyzing the results and identifying the effect of the therapeutic intervention in the experimental group, the control group was invited to participate in the educational sessions to observe the ethics. Treatment sessions were implemented based on Chronic Diseases Cognitive-Behavioral Therapy Program. Data were analyzed based on statistical indices and methods including percentage, frequency, mean, standard deviation, and analysis of covariance in SPSS 21 software.

Description of sessions

1- Pre-test, the establishment of therapeutic communication and review of goals
2-Evaluation and formulation
3- A review of the previous sessions and training the knowledge on interactive system of stress, emotion, and behavior systems.
4- Exchange of feelings and Psychological interrogation and discovery of negative thoughts
5-Introducting the techniques related to intrusive thoughts and presentation of problem solving techniques
6-Gaining knowledge on all kinds of meta-cognitive beliefs and relaxation skills
7- Behavioral contractual technique for drug use and follow-up treatment
8- Change of beliefs and attitudes toward the individual-social status drawing cognitive maps
9-Training logical analysis of social and individual beliefs
10- Training the principles of social life skills
11- Discussing the events and presentations of stress control techniques in individual and social problems.
12-Reviewing, presenting, and summing up of the techniques and surveying and feedback on Cognitive-Behavioral Therapy Program and performing the post-test

Adherence to treatment - Adherence to Treatment Questionnaire was designed by Madanlou in 2013 for chronic disease patients. The questionnaire included 40 questions in the areas of effort in treatment (9 questions), willingness to participate in treatment (7 questions), adaptability (7 questions), integrating treatment with life (5 questions), adherence to treatment (4 question), commitment to treatment (5 questions), and strategy in implementing the treatment (3 questions). According to the questionnaire, score 75-100 means very good adherence, score 50-74 means good adherence, score 26-49 means moderate adherence, and score 0-25 means weak adherence. Madanlou assessed the reliability of the adherence to treatment tool by re-test method and his study reported the correlation coefficient r = 0.875 and it was 44.52 ± 62.25) in the area of strategy in implementing the treatment[20] .

General Health Questionnaire (GHQ-28): The GHQ questionnaire is multi-dimensional test used to assess the non-psychological disorders in various statuses of communities[21]. GHQ was first developed by Goldberg in 1972. The original questionnaire has 60 questions but its short forms include 30, 27, and 12 questions in different studies[22]. Different forms of the GHQ have high validity and efficiency and the efficiency of the 12-question form is approximately the same as the 60-question form. Hodiamont et al (1988) implemented the GHQ, Emotional Balance Scale, and Amsterdam Biography Questionnaire on sample group in the Amsterdam City[21] (quoted by Taghavi,

2001). With regard to testing the reliability and validity[21] in the Iranian population, Taghavi (2001) implemented the GHQ (28-question form) on 167 students.

In this research, reliability of the GHQ was assessed using test-retest, split-half and Cronbach's Alpha methods and it was reported 70, 93, and 90%, respectively. Concurrent reliability of the questionnaire was also reported 55% through implementing Middlesex Hospital Questionnaire MHQ. The correlation coefficients of the sub-scales of this questionnaire with total score were reported at a satisfactory level and between 72 and 87%[22]..

Results

Table 1 presents the results of the study conducted on 30 HIV patients. It shows that the majority of the samples were in the age range of 35-30 years with a mean and SD of 8±3.33 and patients in the age range of 25 to 47 with a mean and SD of 37±19.28. 50±15% of the patients had a diploma level of education (highest frequency) and 3.33±1% of the patients had a master level of education (lowest frequency). In addition, 19 of them (6.37%) were male and 11 (33.63%) were female.

Table 1. Distribution of demographic variables of the studied sample

Variable		Experimental	Control	SD± frequency
Age group	25-30 years	3	5	33.8± 3
Education	Diploma	8	7	15± 50
	Master	1	0	33.1± 3
Gender	Male	11	8	37.19± 66
	Female	4	7	63.11± 33

Table 2. Mean adherence to treatment and general health in experimental and control groups in pre-test, post-test and follow-up stages

scale	group	n	Post-test mean ±SD	Follow-up mean ±SD
Adherence To Treatment	Experimental	15	13.25± 50.7	20.53± 43.7
	Control	15	80.82± 20.1	27.15± 19.2
General Health	Experimental	15	7.87 ± 22.2	80.65 ± 21.2
	Control	15	13.07± 57.8	7.33 ± 53.5

As shown in Table 2, the mean of adherence to treatment was 18.93 in the pre-test in the experimental group which changed to 50.13 and 43.20 in the post-test and follow-up stages, respectively. The mean of public health variable was 51.73 in the pre-test in the experimental group which changed to 22.07 and 20.43 in the post-test and follow-up stages, respectively. As seen, the variables of adherence to treatment and general health in the experimental group changed after the implementation of cognitive-behavioral therapy. Moreover, in the inferential section, before implementing the covariance test, its assumptions are examined as follows. Leven's test was used to examine the homogeneity or equality of dependent variable (adherence to treatment Sig = 0.57, F(1, 28) = 0.33), and general health Sig = F(1, 28) = 2.89). It can be stated that assumption of homogeneity (equality) of variances in the two experimental and control groups is confirmed for the research variables. Table 3 presents the values of Kolmogorov– Smirnov values for examining the normal distribution of dependent

variables. Results suggest the normal distribution of these variables in two groups.

Table 3. Kolmogorov – Smirnov test to examine the normality of population

Macro dimensions		Frequency	Test value	Significance level
Adherence to treatment	Pre-test	30	0.69	0.72
	Post-test	30	1.32	0.07
	Follow-up	30	1.26	0.08
General health	Pre-test	30	0.6	0.86
	Post-test	30	1.32	0.07
	Follow-up	30	1.26	0.08

The results of analysis of covariance in Table 4 show a significant difference between the mean scores of post-test and follow-up of adherence to treatment after elimination of the pre-test effect ($\mu^{2=}$0.66, p<0.000, and F (1, 30)= 154.84 for post-test and $\mu^{2=}$0.55, p<0.001, and F (1, 30)= 112.33 for follow-up). Therefore, the mean scores of post-test and follow-up of the experimental group were significantly higher in the adherence to treatment than those in the control group. Considering the chi-square at the post-test and follow-up stages, it can be stated that 66 and 55% of these changes are due to the effect of the independent variable and its effectiveness is stable in the follow-up stage.

Table 4. Results of analysis of covariance in examining the effect of cognitive-behavioral therapy on adherence to treatment

Sub-scales		Sum squares	df	Mean squares	F	Significance level	Eta squared	Statistical power
Post-test	Pre-test	80.9	1	80.9	53.3	71	11	44
	group	2.1544	1	2.1544	84.184	0	66	1
Follow-up	Pre-test	70.287	1	70.87	58.13	1	33	94
	group	48.1495	1	48.1495	33.112	0	55	1

Table 5 shows a significant difference between the mean scores of post-test and follow-up of general health after elimination of the pre-test effect ($\mu^{2=}$0.67, p<0.000, and F (1, 30)= 155.21 for post-test and $\mu^{2=}$0.59, p<0.005, and F (1, 30)= 97.60 for follow-up).

Therefore, the mean scores of post-test and follow-up of the experimental group were significantly higher in the general health than those in the control group. Considering the chi-square at the post-test and follow-up stages, it can be stated that 67 and 59% of these changes are due to the effect of the independent variable. In other words, cognitive-behavioral therapy significantly enhanced the general health of patients and its effectiveness is stable in the follow-up stage.

Table 5. results of analysis of covariance in examining the effect of cognitive-behavioral therapy on general health

	Sub-scales	Sum squares	df	Mean squares	F	Significance level	Eta squared	Statistical power
Post-test	Pre-test	1.71	1	1.71	0.074	0.78	0.003	0.05
	group	1257.04	1	1257.04	155.22	0.0	0.67	1
Follow-up	Pre-test	130.44	1	130.44	9.59	0.005	0.26	0.84
	group	833.84	1	833.48	97.6	0.0	0.59	1

Discussion

This study aimed to evaluate the effect of cognitive-behavioral therapy on adherence to treatment and general health in HIV positive patients in Tehran. After implementing Cognitive-Behavioral Therapy, adherence to treatment and mental health scores in the experimental group patients after the intervention had a significant difference with those of the control group ($P < 0.05$). This difference indicates the effect of cognitive-behavioral therapy on adherence to treatment and general health of the experimental group compared to the control group. Thus, the first hypothesis of the study that states cognitive-behavioral therapy has an effect on adherence to treatment of HIV positive patients is confirmed. The results of this study are in line with those of other studies in this regard[23,24,16,1].

According to the study conducted by Velard, drug adherence is a major challenge in patients with chronic diseases and if they do not adhere to treatment programs, they may suffer serious consequences, including recurrence, progression of disability and need to be hospitalized[25] As stated before, emotional distress is one of the most common factors associated with adherence to treatment[26]. Another study has also shown that depression is prevalent in HIV patients[11] and stress contributes to progression of this disease[9]. All of these factors exacerbate the physical condition of the patients. Cognitive-behavioral therapy focuses on patients' dysfunctional beliefs and thoughts. Emphasizing that dysfunctional beliefs and thoughts cause emotional distress, the treatment process helps patients to challenge them and to seek cognitive reconstruction and to replace healthy and efficient thoughts and beliefs. Therapeutic conditions help the patient to understand many of the emotional problems in the way of their interpretation of events and consequently their reaction to the events. In psychotherapy sessions, patients become familiar with techniques that can challenge dysfunctional thoughts and they can reduce the social stigma of the disease and follow up the treatment seriously by avoiding self-starvation, personalizing events, being aware of the disease and imagining a brighter future with the disease, and training effective communication skills that patients may have lost in the course of the disease.

Subjects showed better performance on the general health variable after implementing the cognitive-behavioral intervention. It indicates that the research hypothesis that states “cognitive-behavioral therapy has an effect on the general health of HIV positive patients” is confirmed. The results of this study are in line with those of the research[27-43] AIDS and HIV positive impose many psychological and social pressures in these people and it can result in the reactions such as infertility, denial, anger, and anxiety, fear, depression and suicidal ideation. Self-harm in women after being aware of HIV

infection can be due to mental disorders and non-tolerance of psychological and social pressures[44]. HIV / AIDS patients suffer from a number of psychological disorders. These disorders affect some aspects of the disease[45]. In explaining these results, it can be said that the fear of being rejected by family and friends causes them to hide their disease, which can spread the infection. Due to empowering patients at mental dimensions, cognitive-behavioral therapy helps patients to improve their health and well-being, and enhance their feelings and reactions to emotional state and with having a realistic view to the conditions; it increases the flexibility of tolerance of the patients against the social and individual challenges[46]. Patients attending psychotherapy sessions compared to patients who did not receive any intervention (control group) in addition to gaining information on the psychological dimensions of HIV disease, learned many strategies including problem solving skills, communication skills, turbulent behavior control, coping with disease, identifying in appropriate thoughts and emotions, and rebuilding them. It can help the patients improve their relationships with family and community and thus reduce mental stress. Bringing relaxation and peace of mind in social and individual situations, cognitive-behavioral therapy enhances the attitudes, feelings, and knowledge of people and helps them to have a positive perception of themselves and the community. The results showed that Cognitive-Behavioral Therapy put a specific focus on thinking patterns and beliefs, because beliefs affect the response of people to thoughts, symptoms and negative emotions. As a result, by challenging the beliefs and reducing the non-useful cognitive processes and facilitating the processing of cognitive styles, cognitive-behavioral therapy could affect the belief of the subjects. Cognitive-behavioral therapy was effective in improving adherence to treatment and mental health of the patients, and the results of previous studies confirm the results of the present study. As research population was limited to Tehran city, we should treat with caution in generalizing the results. It is recommended that this study be conducted in HIV positive patients living in other provinces with different cultures to increase the generalizability of the results. Conducting longitudinal studies in this regard, investigating the socio-economic and family status of the HIV positive patients in future studies and conducting studies on separate samples of female and male genders are recommended. As the duration of this study was three months, it is recommended the 6, 12, and 18-month follow-up periods to be considered to examine the stability of the treatment effect.

Conclusion

The results of this study showed that the use of cognitive-behavioral therapy was effective in enhancing adherence to treatment and mental health. After implementing the cognitive-behavioral therapy, adherence to the treatment and mental health scores showed a significant difference between the patients in the experimental group and patients in the control group.

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Competing interests:

The authors declare to have no conflicts of interests.

Authors' contributions:

All authors contributed equally to the article.

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