KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 12 March 2024
Revised 09 May 2024
Accepted 14 May 2024
Published online 10 June 2024

Journal of Adolescent and Youth Psychological Studies

Volume 5, Issue 6, pp 50-58

E-ISSN: 2981-2526

The Effectiveness of Cognitive-Behavioral Therapy on Self-Efficacy and Emotion Regulation in HIV-Positive Patients

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A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Talebi, H., Mirzaian, B., & Dousti, Y. (2024). The Effectiveness of Cognitive-Behavioral Therapy on Self-Efficacy and Emotion Regulation in HIV-Positive Patients. *Journal of Adolescent and Youth Psychological Studies, 5*(6), 50-58. http://doi.org/10.61838/kman.jayps.5.6.6

A B S T R A C T

Objective: AIDS, or Acquired Immunodeficiency Syndrome, is a chronic and widespread disease that, with its high mortality rate, is distinctly different from other diseases. The present study aimed to investigate the effect of cognitive-behavioral therapy (CBT) on self-efficacy and emotion regulation in HIV-positive patients.

Methods and Materials: In a quasi-experimental method with a pre-test, post-test, and follow-up design with a control group, 30 HIV-positive patients receiving treatment at the Imam Khomeini Hospital in Tehran were non-randomly and conveniently selected and then randomly assigned to two groups (experimental and control groups, 15 patients each). Prior to the commencement of therapeutic interventions, participants from both groups completed the Sherer Self-Efficacy Scale (1982) and the Gratz and Roemer Difficulties in Emotion Regulation Scale (2004). The experimental group underwent 12 sessions of cognitive-behavioral therapy, whereas the control group did not receive any intervention during this period. Both groups were post-tested, and after a three-month period, they completed the research questionnaires again (three-month follow-up). The research data were analyzed using repeated measures analysis of variance and SPSS.22 software.

Findings: The results indicated that cognitive-behavioral therapy significantly improved self-efficacy ($F=59.45$, $P<0.001$) and emotion regulation ($F=144.42$, $P<0.001$) in HIV-positive patients.

Conclusion: It can be concluded that cognitive-behavioral therapy can lead to improvements in self-efficacy and emotion regulation in HIV-positive patients.

Keywords: *Cognitive-behavioral therapy, self-efficacy, emotion regulation, HIV.*

1. Introduction

AIDS, or Acquired Immunodeficiency Syndrome, is a chronic and widespread disease that, along with a high mortality rate, is distinctly different from other diseases (García & Côté, 2003; Gonzalez et al., 2011; Moore, 2004). This disease was first observed in 1981 and identified in 1983 (Moore, 2004). The Human Immunodeficiency Virus (HIV), established as a lentivirus, was identified as the causative agent two years later (Gonzalez et al., 2011). The first confirmed case of AIDS was seen in Congo in 1959. In 2015, more than 36 million people were living with HIV,

with about 1.2 million new infections occurring annually, indicating a decline in the infection rate (Farias et al., 2020). It is estimated that over 70% of global AIDS infections reside in Sub-Saharan Africa, which hosts 10% of the world's population. Over 25% of adults aged 15 to 49 in these countries are affected by AIDS. Although the Middle East and North Africa are among the regions with the lowest number of infections globally, Iran has the highest number of patients compared to other countries in the region (Owusu, 2019). According to official statistics provided by the National Center for AIDS Prevention, a total of 27,416 individuals in Iran were identified as HIV/AIDS patients by December 22, 2013, with 89% of them being men. Among these individuals, 5,428 had AIDS, and the rest were infected with HIV (Mirzapour et al., 2022).

Adherence to treatment is crucial for the success of any medical treatment. In a meta-analysis including both children and adults, medical treatment outcomes were compared between patients who adhered to their treatment and those who did not, showing a 26% reduction in treatment outcomes. If a patient adheres, they are almost three times more likely to achieve treatment success. Adherence rates among adolescents vary widely, from 10% to 89%, for chronic diseases. For chronic diseases, low adherence increases medical complications (hospitalization), contributes to poorer quality of life, and leads to overuse of the healthcare system (unnecessary consultations and medical research). Low adherence increases healthcare costs (Taddeo et al., 2008). Antiretroviral treatment has given hope to people living with HIV/AIDS and plays a role in improving their quality of life. However, the effectiveness of these treatments is directly related to the level of adherence and commitment to them. Researchers have shown that many factors play an important role in the adoption and maintenance of adherence behavior. Understanding these factors is essential for developing interventions that improve adherence to treatment regimens among those living with HIV/AIDS (García & Côté, 2003).

Given the extent of the disease and its profound impact on the physical, psychological, and social dimensions of individuals, it is not sufficient to examine the health status of people with AIDS solely from a physical perspective. Psychological variables are crucial in understanding how patients respond to the challenges of chronic medical problems. Chronic medical problems are associated with a range of psychological issues. The cycle of AIDS-related diseases is accompanied by poor mental health (feelings of hopelessness and helplessness). Depression can become very severe (Sawyer et al., 2010). Psychological factors affect the functioning of the immune system. High stress, depression, and lack of emotion regulation and social support are related to increased AIDS morbidity (Mirzapour et al., 2022; Pirasteh Motlagh & Nikmanesh, 2012). One reason for the rapid progression of the disease is the direct link between depression and non-adherence to medication regimens (Gonzalez et al., 2011). Additionally, there is a linear relationship between emotion regulation and mental health. Emotion regulation is the process through which individuals consciously and unconsciously modify their emotions to respond appropriately to diverse environmental demands. Emotion regulation is closely linked to patterns of psychopathology. For example, anxiety and depression disorders result from problems with emotion regulation. The assumption in explaining this relationship is that if individuals cannot effectively manage emotional responses to daily events or experience severe and prolonged periods of distress, they may exhibit diagnosable depression and anxiety. Successful emotion regulation is associated with positive mental health outcomes, academic performance, and job performance (García & Côté, 2003).

All individuals face problems and obstacles in their lives. How people handle these obstacles and problems relates to their personality traits. Individuals' beliefs organize their world and give meaning to their experiences. Self-efficacy is an important factor in the constructive system of human competence, thus enabling individuals to perform extraordinary tasks by using skills in dealing with obstacles (Wang & Li, 2011). Cognitive-behavioral considerations have been successfully applied to treat mood and anxiety disorders in HIV-positive individuals. This is because cognitive-behavioral therapy (CBT) provides coping skills that can help patients control their disease. Specifically, cognitive-behavioral stress management therapies have been shown to affect factors such as social support, personal growth, mood, and coping in promoting adherence to treatment for people living with HIV (Carrico et al., 2005; De Vito et al., 2022).

Due to the social stigma associated with HIV, the nature of the disease is highly unfavorable for those infected. Issues such as fear of stigma, low self-efficacy, fear of rejection, fear of losing one's job and social status, lack of effective treatment, and fear of death exacerbate HIV symptoms. Given the nature of the disease, most patients experience a lack of social support and negative self-worth. Self-efficacy is directly related to healthy behaviors and indirectly influences healthy behaviors to achieve goals. Self-efficacy

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E-ISSN: 2981-2526

affects the challenges individuals face. Individuals with strong self-efficacy choose more difficult goals and focus on situations and conditions rather than obstacles (Wang & Li, 2011).

Cognitive-behavioral interventions and stress management generally reduce anxiety, depression, and distress in HIV-positive individuals and improve their quality of life (Scott-Sheldon et al., 2008). Reducing stress, strengthening protective factors such as social support, positive mental states, and adherence to treatment are effective in psychotherapy for these individuals (Antoni et al., 2006). Antoni et al. (2006) studied HIV-positive men on a highly active antiretroviral treatment regimen who were trained for ten weeks to take prescribed medications as directed. Half of these individuals were simultaneously placed in a cognitive-behavioral stress management program. Their study showed that men in this program had lower viral loads 15 months later than men who only received drug education. The second group, which did not undergo treatment, showed no change in viral load (Antoni et al., 2006). Anderson et al. (2003) in their study of 227 patients who underwent breast surgery for breast cancer randomly assigned them to a cognitive intervention group plus assessment. The interventions included stress reduction, mood enhancement, changing important health behaviors (such as smoking cessation, increasing exercise, etc.), and strict adherence to treatment and care related to the disease. They showed success in reducing stress and increasing positive mood and healthy behavior (Andersen et al., 2008). The present study aimed to investigate the effect of cognitive-behavioral therapy on self-efficacy and emotion regulation in HIV-positive patients.

2. Methods and Materials

2.1. Study Design and Participants

The present research method was quasi-experimental with a pre-test-post-test design with a control group. The statistical population in this study included all HIV-positive patients who visited the Imam Khomeini Hospital treatment center in Tehran from October 14, 2017, to October 28, 2017, to receive medication. In this study, non-random sampling was used from the accessible population of HIV-positive individuals, selecting 52 people as the sample and randomly assigning them to two groups, experimental and control. Four individuals from both groups were excluded from the study due to a personality disorder diagnosis. During the research process, 9 individuals from the experimental group withdrew from the treatment, and to ensure more precise data analysis, 9 individuals from the control group were also excluded. Finally, the sample consisted of 30 individuals, including 11 women and 19 men, divided into experimental and control groups. Initial screening for inclusion criteria was conducted. Inclusion criteria included a diagnosis of HIV-positive, currently taking medication for at least 6 months; minimum high school education; absence of personality disorders; not currently enrolled in psychotherapy or another treatment program; age range of 18 to 60 years; similar socioeconomic status among patients. Exclusion criteria included missing more than four sessions and having diagnostic criteria for personality disorders.

In the initial stages of screening for selecting HIV-positive patients, a visit was made to the National AIDS Association, which did not provide the necessary cooperation for issuing recommendation letters to treatment centers. Therefore, access to HIV-positive cases was facilitated by contacting the head of the Infectious Diseases Department at the hospital and the recommendation of a staff member. Patients who routinely visited the clinic for medication were informed about the study by a staff member and invited to participate. After building trust regarding the confidentiality of information and explaining the importance of the research, patients agreed to participate in the treatment and complete the questionnaires at the researcher's counseling center. Fifty-two individuals agreed to participate and were randomly assigned to experimental and control groups. Both groups completed the pre-test questionnaires, and the experimental group was scheduled to attend psychotherapy sessions while the control group did not receive any intervention during the study. After administering the SCID-II test, two individuals from the experimental group and one from the control group were diagnosed with personality disorders and excluded, along with one additional control group member for more accurate analysis. During the study, nine individuals from the experimental group withdrew due to personal issues and missing more than four sessions, leaving 15 participants who attended all sessions. Nine control group members were randomly excluded to balance the group sizes and allow for more precise analysis. Each patient received weekly 45-60 minute sessions for 12 weeks by a therapist. After the sessions, both groups completed the post-test. During the three-month follow-up, both groups completed the research tests again, and the control group was invited to participate in the training sessions after the results were analyzed and

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the intervention's impact was determined. The treatment sessions were based on the cognitive therapy books by Judith Beck and the cognitive therapy by Michael Neenan and Windy Dryden, addressing issues such as adherence to treatment, mental health, self-efficacy, and emotion regulation. Psychological assessments were conducted through tests and interviews, and individuals' issues were treated.

2.2. Measures

2.2.1. Self-Efficacy

The General Self-Efficacy Scale (GSES-17) consists of 17 items, each rated on a Likert scale from "strongly disagree" to "strongly agree." This scale was translated and validated by Barati (1996). Bakhtiyari Barat (1997) assessed the construct validity of the self-efficacy scale by correlating its scores with measures of several personality traits (Rotter's Internal-External Control Scale, Personal Control Subscale, Marlow-Crowne Social Desirability Scale, and Rosenberg Interpersonal Competence Scale), with predicted correlations between the self-efficacy scale and personality traits being moderate (61% and significant at the 5% level), supporting the construct validity. The scale's reliability coefficient using the Guttman split-half method and Cronbach's alpha was 0.79. Also, in Vaqareh's (2001) study, the self-efficacy scale's reliability using Cronbach's alpha was 0.85. Najafi (2001) randomly selected 30 subjects and administered the self-efficacy test, with Cronbach's alpha of 0.83 and Spearman-Brown coefficient of 0.83. Ganji and Farahani (2009) obtained a reliability coefficient of 0.87 using Cronbach's alpha (Parsakia et al., 2024).

2.2.2. Difficulties in Emotion Regulation

Difficulties in Emotion Regulation Scale (DERS) was developed by Gratz and Roemer in 2004 and consists of 36 items rated on a 5-point Likert scale (1 = almost never, 5 = almost always). This scale provides a total score and specific scores for each of its six subscales: nonacceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Weinberg and Klonsky (2009) examined the reliability and validity of this scale in adolescents. Exploratory factor analysis supported the six-factor structure, with good to excellent internal consistency (alpha coefficients of 0.89 - 0.76). Scores correlated with psychological problems indicating difficulties in emotion regulation, particularly depression, anxiety, suicidal thoughts, eating disorders, and alcohol abuse, supporting construct validity. Internal consistency of the total scale using Cronbach's alpha was 0.93. Stelz (2010) examined the psychometric properties of this scale in patients with generalized anxiety disorder and a control group, finding good internal consistency (alpha coefficient of 0.76) and good internal consistency for each subscale. Although the nonacceptance subscale showed weak to moderate correlations with other subscales, test-retest reliability was 0.53. Cronbach's alpha for subscales ranged from 0.46 to 0.83, indicating weak to good internal consistency. Subscale intercorrelations ranged from weak to moderate. Coutinho, Ribeiro, Ferreirinha, and Dias (2010) examined the validity and reliability of the scale in Portugal, finding a Cronbach's alpha of 0.92 and good internal consistency. Test-retest reliability for subscales ranged from 0.67 to 0.82, with correlations between subscales and psychiatric symptoms except for emotional awareness. Aminian (2009) examined the scale's validity and reliability among women and girls in Ahvaz, with Cronbach's alpha and split-half reliability of 0.86 and 0.80, respectively, indicating good reliability. The scale also showed positive and significant correlations with Zuckerman's Sensation Seeking Scale, indicating construct validity. Heidari and Eghbal also examined the scale's reliability among all married couples working in the steel industry in Ahvaz, finding Cronbach's alpha and split-half reliability of 0.91 and 0.85, respectively (Fallahi et al., 2022).

2.3. Intervention

2.3.1. Cognitive Behavioral Therapy

The intervention protocol for this study involved a structured cognitive-behavioral therapy (CBT) program conducted over 12 weekly sessions, each lasting 45 to 60 minutes. The therapy sessions were designed to improve self-efficacy and emotion regulation in HIV-positive patients. Each session focused on specific skills and techniques derived from CBT principles, tailored to address the psychological challenges associated with living with HIV. The sessions were based on the cognitive therapy manuals by Judith Beck and the cognitive therapy approaches of Michael Neenan and Windy Dryden. The following paragraphs describe the content and objectives of each session (Antoni et al., 2006; Carrico et al., 2005; De Vito et al., 2022).

Session 1: Introduction and Psychoeducation

In the first session, participants were introduced to the structure and goals of the therapy. Psychoeducation about HIV, its psychological impact, and the basics of CBT was provided. This session aimed to establish a therapeutic alliance, set expectations, and provide an overview of the treatment process. Participants discussed their personal experiences with HIV and identified initial therapy goals.

Session 2: Identifying Negative Thoughts

The second session focused on helping participants identify and understand their negative thoughts and beliefs related to their illness and overall life. Techniques such as thought records were introduced to help them track their automatic negative thoughts. The aim was to increase awareness of the impact of these thoughts on their emotions and behaviors.

Session 3: Cognitive Restructuring

Building on the previous session, participants were taught cognitive restructuring techniques. This involved challenging and reframing negative thoughts into more balanced and realistic ones. Role-playing and guided discovery were used to practice these skills, aiming to reduce negative thought patterns and improve mood.

Session 4: Behavioral Activation

In this session, the focus was on increasing engagement in positive and meaningful activities. Participants identified activities they enjoyed or found fulfilling and developed a plan to incorporate these activities into their daily routines. The goal was to counteract the withdrawal and inactivity often associated with depression and low self-efficacy.

Session 5: Problem-Solving Skills

Participants were introduced to problem-solving techniques to manage the practical and emotional challenges they face. This session involved defining problems, generating potential solutions, evaluating the pros and cons, and selecting the best course of action. This skill aimed to enhance participants' sense of control and self-efficacy.

Session 6: Emotion Regulation Techniques

This session focused on teaching participants strategies for regulating their emotions. Techniques such as mindfulness, deep breathing, and progressive muscle relaxation were introduced. Participants practiced these skills to manage stress and negative emotions more effectively.

Session 7: Enhancing Self-Efficacy

In this session, strategies to boost self-efficacy were emphasized. Participants explored their past successes and strengths and set small, achievable goals to build confidence. Positive self-talk and affirmations were also introduced as tools to enhance self-belief.

Session 8: Social Support and Communication Skills

The importance of social support and effective communication was the focus of this session. Participants discussed their support networks and identified ways to strengthen these connections. Communication skills training, including assertiveness and expressing needs, was also provided.

Session 9: Managing Stigma and Disclosure

This session addressed the challenges of stigma and the decision to disclose one's HIV status. Participants explored their fears and concerns about stigma and practiced strategies for managing these situations. The session aimed to reduce the negative impact of stigma on their mental health.

Session 10: Relapse Prevention

Participants were taught relapse prevention strategies to maintain the gains made during therapy. This session included identifying potential triggers for negative thoughts and behaviors and developing a plan to cope with these triggers. The aim was to ensure long-term adherence to the skills learned.

Session 11: Review and Reinforcement

In this session, the key skills and concepts covered in previous sessions were reviewed. Participants had the opportunity to discuss their progress, reinforce their learning, and address any remaining challenges. This session aimed to consolidate the skills and prepare participants for the end of therapy.

Session 12: Closure and Future Planning

The final session focused on summarizing the therapy process, celebrating participants' progress, and planning for the future. Participants developed a long-term self-care plan, including how to continue using the skills learned and where to seek support if needed. The session concluded with a discussion on the transition out of therapy and maintaining well-being.

2.4. Data analysis

Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to describe the information. Statistical charts, such as bar charts, were used to display demographic characteristics of participants. Repeated measures ANOVA and SPSS 21 software were used for inferential statistical analysis, with a significance level of $\alpha = 0.05$.

3. Findings and Results

34.63% of the sample were men, and 36.66% were women. The majority of the sample had a high school diploma, while the smallest group had a master's degree. Most of the sample were aged 25-30 years, and the fewest were aged 35-40 years. The results of descriptive statistics analysis are shown in Table 1.

Table 1

Descriptive Statistics of Research Variables

Variable	Group	N	Pre-test Mean (SD)	Post-test Mean (SD)	Follow-up Mean (SD)
Self-Efficacy	Experimental	15	42.53 (3.50)	59.67 (4.71)	49.80 (1.85)
	Control	15	62.07 (3.26)	61.53 (4.13)	59.93 (2.68)
Emotion Regulation	Experimental	15	68.33 (6.10)	126.80 (4.45)	65.93 (4.63)
	Control	15	128.60 (9.94)	127.80 (5.56)	124.73 (10.32)

To examine the significance of differences in quality of life and marital intimacy scores between the experimental and control groups, repeated measures analysis of variance was used. The results of the Kolmogorov-Smirnov test indicated normality of the research variables. Levene's test for homogeneity of variances in the experimental and control groups showed equality of variances in the pre-test, post-test, and follow-up stages. The results of Mauchly's test of sphericity indicated a violation of the sphericity assumption, necessitating the use of the Greenhouse-Geisser correction.

Table 2

Repeated Measures Analysis of Variance for Comparing Pre-test, Post-test, and Follow-up for Self-Efficacy and Emotion Regulation in Experimental and Control Groups

Scale	Source	Sum of Squares	df	Mean Square	F	p	Eta Squared
Self-Efficacy	Time	119.46	1.13	92.71	148.15	<.001	.84
	Time*Group	93.95	2.26	72.91	116.52	<.001	.80
	Group	1788.13	1	1788.13	59.45	<.001	.51
Emotion Regulation	Time	400.08	1.13	296.70	261.46	<.001	.90
	Time*Group	277.06	2.26	205.46	181.07	<.001	.86
	Group	1704.39	1	1704.39	144.42	<.001	.42

The results in Table 2 indicate that the analysis of variance for the within-group factor (time) is significant, as is the between-group factor. This means that the effect of time is significant when considering the group effect. Additionally, the interaction between group and time is significant. Bonferroni post hoc tests were used for pairwise comparisons of the groups.

Table 3

Bonferroni Post Hoc Test Results for Comparing Self-Efficacy and Emotion Regulation

Variable	Stage	Stage	Mean Difference	p
Self-Efficacy	Pre-test	Post-test	-17.14	<.001
		Follow-up	-7.27	<.001
	Post-test	Follow-up	10.13	<.001
Emotion Regulation	Pre-test	Post-test	-58.47	<.001
		Follow-up	2.40	.096
	Post-test	Follow-up	60.87	<.001

The results in **Error! Reference source not found.** show that self-efficacy and emotion regulation in the experimental group were higher in the post-test than in the pre-test ($p < .001$). Additionally, self-efficacy in the experimental group differed between the pre-test and post-test stages ($p < .001$). Self-efficacy and emotion regulation also differed between the post-test and follow-up stages ($p < .001$).

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4. Discussion and Conclusion

The present study aimed to investigate the effect of cognitive-behavioral therapy on self-efficacy and emotion regulation in HIV-positive patients. The results showed that cognitive-behavioral therapy increases the level of self-efficacy in HIV-positive patients. The findings indicate that cognitive-behavioral therapy significantly increases the self-efficacy of patients with this infection, and the increase in self-efficacy remained stable in the three-month follow-up. These findings are consistent with previous research (Antoni et al., 2006; Carrico et al., 2005; De Vito et al., 2022; Moore, 2004).

In explaining this finding, it can be said that developing and teaching self-efficacy skills may play an important role in creating preventive behaviors against HIV transmission in patients. Individuals with high self-efficacy believe they can effectively handle events and situations they encounter. Research shows that self-efficacy is associated with better health, higher success, and social integration (Parsakia et al., 2024; Wang & Li, 2011). Other practical findings indicate that cognitive coping strategies and goal-oriented self-efficacy variables are significantly associated with personal growth in people with AIDS. AIDS changes an individual's life path, reducing confidence, increasing feelings of vulnerability, and causing troubled thoughts in patients (Akdeniz Kudubes et al., 2022; Wang & Li, 2011). The study findings indicate that cognitive-behavioral therapy significantly increases the level of self-efficacy. HIV infection, with its impact on patients' psychological and social functioning, causes emotional distress, low self-esteem, and low self-efficacy. Treatment conditions create a facilitating environment and teach cognitive-behavioral techniques, increasing patients' self-efficacy. Patients with HIV have low self-efficacy due to social pressure and loss of social status.

The study results also showed that cognitive-behavioral therapy significantly increases the level of emotion regulation in HIV-positive patients. The results of the hypothesis test indicated that cognitive-behavioral therapy could increase emotion regulation, and the changes remained stable in the three-month follow-up. This finding is consistent with prior studies (Antoni et al., 2006; Carrico et al., 2005; De Vito et al., 2022).

In explaining this finding, it can be said that we all experience various emotions and try to cope with them using effective or ineffective methods. Without different emotions, our lives would lack meaning, feeling, richness, and joy. The results indicate that cognitive-behavioral therapy improves emotion regulation in HIV-positive adults, and its effectiveness remains stable in the follow-up stage. The dominant theoretical perspective suggests that individuals regulate their emotions to influence how they experience and express their emotions (Fallahi et al., 2022; Taddeo et al., 2008). HIV-positive patients experience high levels of emotional distress and have significant difficulties controlling emotions and anger. Cognitive therapy sessions create conditions that help patients identify various difficult and painful emotions, relate emotions to personal needs and interpersonal relationships, troublesome beliefs, and strategies patients use to interpret, judge, control, and act on emotions, and create new, more flexible, and adaptive strategies and beliefs about their emotional experiences.

5. Limitations & Suggestions

This study, like others, has limitations that directly and indirectly affect it. The sample was selected conveniently and non-randomly, which may reduce the external validity of the research. The number of samples in the experimental and control groups was relatively small, and more samples should have been assigned to both groups, considering patient attrition. The lack of cooperation from centers where patients regularly visited and received medication meant that sample collection was conducted with many derivatives. Given that the research sample was limited to Tehran, caution should be exercised in generalizing the results. The suggestions section includes recommendations for applying this research in the community of HIV-positive patients. It is important to note that given the research topic, which examines the role of cognitive-behavioral therapy in increasing mental health, adherence to treatment, self-efficacy, and emotion regulation, the shame associated with the disease in individuals and families and the psychological pressure from social stigma, which is greater than for other physical diseases, and society's negative attitudes and incorrect beliefs about the transmission and infection of this disease, and the lack of relative recovery for HIV-positive patients, implementing such interventions in inpatient and outpatient treatment centers in the country faces challenges. Belief in the patient's inability to change leads to the loss of all positive psychological and social functions of the patient and even his/her family members. Family members should participate in the treatment of patients. The family should be aware of the disease's cause, symptoms, likelihood of symptom exacerbation, medication treatment, problem-

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E-ISSN: 2981-2526

solving skills, and communication skills to help the treatment process. Providing educational booklets, brochures, and introducing useful books to patients can be beneficial. The more information patients have about the disease, the better they can control the symptoms. Supporting non-governmental organizations and advocacy groups can enhance the services provided to patients by these organizations. Informing through mass media can prevent disease transmission and new infections and correct society's defective beliefs that lead to patient isolation.

Acknowledgments

We would like to express our appreciation and gratitude to all those who cooperated in carrying out this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

Authors' Contributions

All authors contributed equally.

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Adolescent and Youth Psychological Studies
E-ISSN: 2981-2526