



Original Article

## Comparing the effectiveness of mindfulness-based stress reduction and spirituality therapy on CD4 cells in AIDS patients

Afshin Tayyebi<sup>1</sup>; Adis Kraskian Mojembari<sup>2</sup>; \*Hasan Ahadi<sup>3</sup>;  
Saeed Malihzakerini<sup>2</sup>; Amin Rafiepoor<sup>4</sup>

<sup>1</sup>Ph.D. student in health psychology, Karaj Branch, Islamic Azad University, Karaj, Iran.

<sup>2</sup>Assistant professor of health psychology, Karaj Branch, Islamic Azad University, Karaj, Iran.

<sup>3</sup>Professor of health psychology, Allameh Tabatabai University, Tehran, Iran.

<sup>4</sup>Assistant professor of psychology, Payame Noor University of Tehran, Iran.

### Abstract

**Introduction:** Psychological factors play an important role in the etiology of AIDS. The aim of this study was to compare the effectiveness of mindfulness based on stress reduction and spiritual therapy on the number of CD4 cells in AIDS patients.

**Materials and Methods:** The statistical population of this clinical study included AIDS patients in Shahriar health centers in 2018. Using the convenient method, 45 people were selected and replaced in 3 groups of 15 cases (two experimental groups and one control group). Then, stress-based mindfulness therapy group and spirituality-therapy group were performed in 8 ninety minute-sessions and the control group did not receive any training. Data were analyzed using analysis of covariance and SPSS software version 23.

**Results:** Mindfulness based on stress reduction and spiritual therapy had a significant effect on increasing CD4 in AIDS patients. However, the effect of mindfulness based on stress reduction on CD4 cell proliferation was greater than spiritual therapy.

**Conclusion:** It seems that stress-based mindfulness and therapeutic spirituality have been effective in increasing CD4 cell count and can be used in patients with AIDS along with medical treatment.

**Keywords:** AIDS, CD4 cells, Mindfulness based on stress reduction, Spiritual therapy.

### Please cite this paper as:

Tayyebi A, Kraskian Mojembari A, Ahadi H, Malihzakerini S, Rafiepoor A. Comparing the effectiveness of mindfulness-based stress reduction and spirituality therapy on CD4 cells in AIDS patients. *Journal of Fundamentals of Mental Health* 2021 Jul-Aug; 23(4):225-232.

### Introduction

AIDS is one of the most acute problems in human societies regarding mortality, high costs of care and treatment, and creating social and psychological problems for these patients (1). Some blood cells that play a role in defending the body and fighting germs have CD4

receptors, and for this reason, they are stroked by Acquired Immune-Deficiency Syndrome (AIDS) viruses.

These cells destabilize the body's defenses and cause AIDS in a festering person (2). Studies have disclosed that CD4 count is one of the major constituents of the treatment outcome in

### \*Corresponding Author:

Department of Health Psychology, Allameh Tabatabai University, Tehran, Iran.  
drhahadi5@gmail.com

Received: Feb. 23, 2021

Accepted: May. 15, 2021

these patients. Other results of this study showed that although patients need more time to pull off the normal count of CD4 cells, the mortality rate is generally reduced when this count is normal (3). Studies indicate that acute stress can attenuate specific antibodies, T cell responses and, changes in T cell monocyte chemokine receptors (4).

Psychological tension can affect the immune system through two-way communication between the central nervous and endocrine systems (5). Several studies demonstrate CD4 cell count reduction in people exposed to lots of stress when confronted with acutely frustrating situations (6).

Psychological tension activates the endocrine-nervous system and increases the secretion of stress hormones, so behavioral and psychological interventions that diminish stress can be efficient in improving the immune system and postponing Human Immunodeficiency Virus (HIV) progression (7). Also, the results of a study indicated that both reception and obligation therapy models could improve the quality of life and psychological well-being of people living with AIDS. However, treatment based on compassion on the psychological component of quality of life was more noticeable (8).

Findings of a study applying mindfulness as a treatment for HIV-infected people showed that it could increase intelligence, problem-solving, cognitive accuracy, and life satisfaction within three months of intervention and the follow-up period (9).

In recent years, researchers have also focused on the influence of religious beliefs on disease. However, some research demonstrates that spiritual and intuitive activities such as attentiveness, spiritual thought, mental imagery towards the world miracles, and deep association with world creators have robust healing impacts on solving life problems and saving humans (10). In a study, findings demonstrate CD4 cell count increased from 15 to 160 in the hospitalized patients but declined in other groups (11). Also, the findings indicated that spiritual peace could enhance the quality of life and CD4 cells count in these patients (12). From Frankl's point of view, death does not make the face of life meaningless relatively. The temporary nature of life makes it meaningful (13).

In a study about spiritual therapy, the response of T lymphocytes revealed that cognitive

therapy combined with a religious approach has been more efficient than classical cognitive-behavioral psychotherapy in diminishing depression and strengthening the immune system (14). Patients with chronic diseases such as AIDS, multiple sclerosis, and cancer due to severe physical and mental complications, pay less attention to finding the meaning and purpose for their lives and cannot find a way to resolve their problems (15).

So, using plans to achieve this meaning and the quality of life improvement appears necessary for these people (16). Therefore, this study aimed to compare the effectiveness of mindfulness-based to stress reduction and spiritual therapy on CD4 cell count in AIDS patients.

### Materials and Methods

This randomized clinical trial approved by Islamic Azad University, Karaj Branch (Ethics ID IR.IAU.K.REC.1397.20). The statistical population included all AIDS patients referred to Shahriar health centers in 2018 (including 120 patients with a 1-10 years history of disease) that were selected by simple random sampling method and were randomly recruited by three peer groups in terms of characteristics (gender, marital status). According to Gall and Borg's (17) opinion in the experimental research, 15 cases are suitable for each group, so in this study, the sample size for each group determines 15 people. Inclusion criteria included platelet count based on the diagnostic criteria for AIDS, no history of any non-AIDS-related drug usage, as well as a history of other autoimmune diseases.

In addition, exclusion criteria included the absence of more than two sessions from treatment, and unwilling to continue. After approving the title, the research phases, and attaining the ethical code, the mentioned places were referred with prior coordination. Then, after reassuring the patients about confidential data, they were entered to study. Subjects were assured that information was kept confidential and could be excluded from the study if they were not satisfied even after completing the questionnaires. Subjects could be informed of the results if they wanted.

Then the pretest was performed, and one week later, the treatment intervention for the experimental groups was started.

Sessions were administrated for two months (one session per week), each session lasting

ninety minutes. The post-test was performed one week after the intervention. To warrant the mental health of all participants, patients were visited by a psychiatrist, and their mental health was confirmed.

#### Research instrument

*A) CD4 Count:* A normal CD4 count ranges from 500-1600 cells/mm<sup>3</sup>. CD4 cell count below 200 indicates severe damage to the immune system and is one of the AIDS/HIV infection symptoms and increases the risk of opportunistic infections (18).

*B) Treatment Protocol of Group Mindfulness:* This protocol was used and validated in a study by Wenson, Nicklick, and Power (19).

In a study by Ghasemi Jobneh, the regular session schedule was as follows: The session initiates with a mindfulness practice. Then the instructor will answer the participants' questions related to the weekly exercises. After that, the issue of the current session is debated with the participants and taught them new exercises. Finally, sufficient explanations will be given at the end of the session regarding the exercises related to next week (20).

*C) Group Spiritual Therapy Protocol:* In this protocol, people regularly participate in eight ninety minute-sessions, one day a week, and discuss the presuppositions of spiritual life and spiritual strategies. This treatment package was designed by Kajbaf et al. (21).

**Table 1.** Content of mindfulness sessions based on therapeutic cognition

Session	Content
First	Introduce the participants, clarify AIDS and its effect on family and members and discuss marital relationships, practice eating raisins, discuss that many people live in an unconscious mind and often do not pay attention to what they do. Do, practice meditation focused on breathing, practice body check
Second	Exercise to scan the body, invite participants to talk about their experiences of mindfulness exercises, examine obstacles, discuss some features of mindfulness such as non-judgment or abandonment, practice thoughts and feelings, practice meditation sitting with a focus on breathing
Third	Short practice of seeing or hearing, sitting meditation focusing on breathing and body sensations, three-minute breathing space, practicing conscious body movements
Fourth	Sitting meditation about breathing, body, sounds, and thoughts (so-called sitting meditation with four main components), discussing stress and the usual reactions of people to difficult situations and alternative attitudes and reactions, conscious walking
fifth	The practice of sitting meditation about breathing, body, sounds, and thoughts, the discussion of acknowledging and accepting the reality of the present situation as it is, the practice of the second series of conscious body movements
Sixth	Three-minute breathing space, the discussion of our thoughts is often not often real content
Seventh	Practice meditation sitting and being open-minded (becoming aware of everything that comes to mind moment by moment), discussing the best way to take care of yourself, practicing exploring pleasant daily activities against unpleasant ones, and learning to plan for pleasant activities, practicing love meditation, and kindness
Eighth	Exercise to scan the body, discuss what you have learned so far, evaluate the training, and provide more resources

**Table 2.** Content of spiritual therapy sessions

Session	Content
First	Familiarize the group members with each other and introduce and express the group counseling rules and principles, creating hope and empathetic relationship and, then the problem of the participants were formulated in the form of a spiritual therapy model. Each participant receives a package containing brochures and meeting summaries.
Second	After reviewing the previous session and giving feedback to the clients, the first premise (saving reality) and the second premise (pleasant and unpleasant feelings do not depend on phenomena but depend on internal attitudes and feelings) of spiritual man were taught. Also in this session, the promotion of intentions and purposeful behaviors and, positive mental imagery towards God was taught.
Third	Third premise (principle of action: this principle will be based on the attributes of God's mercy and generosity. That is, God always provides the opportunity for human growth) and fourth premise (divisibility: means that worldly affairs could be divided into changeable and unchangeable). Also in this session, the order's position in the administration of the system of existence and the practice of order in life, were taught.
Fourth	The fifth premise (the moral world is created and always moving in the direction of happiness) of the spiritual man was taught. Also at this meeting, the strategy of prayer and its place in human life and excellence, increasing marital satisfaction and coping with anxiety was discussed.
Fifth	The sixth premise (the future is not entirely in our hands) of spiritual man was taught. Also at this meeting, the strategies of remembrance, trust and, hope in God were discussed in the issues that will occur in the future.
Sixth	The seventh premise (human is constantly in touch with God) of spiritual man was taught. Also in this session, the description and spiritual and unifying interpretation of the life events of the participants were taught. The role and place of patience as a strategy for increasing marital satisfaction and coping with anxiety was taught.
Seventh	The eighth (spiritual man lives by his attributes, not by his property and possessions) and the ninth (attaining spiritual life requires charity, forgiveness, forgiveness and, love) of spiritual man were taught. Also in this meeting, a polite and respectful presence in the presence of God was taught.
Eighth	The tenth premise (understanding the meaning of hardships and hardships and responsibility to God, self, others, and existence) of spiritual man was taught. Also in this session, ten presuppositions of spiritual man were reviewed once again.

The control group did not use any special approach or program. Research data were analyzed using an analysis of covariance.

### Results

The demographic data indicated that 32 men and 13 women participated in this study. Also, 17 participants were married (37.8%). In term of age, 10 cases (22.2%) aged under 30 years, 14 cases (31.1%) aged 30-40 years, while 11 cases and 10 cases aged 41-50 years and over 50 years, respectively. Also, 23 cases were

undergraduate (51.1%), 11 cases, 8 cases and 3 cases had diploma, postgraduate, bachelor and higher educational level, respectively. The duration of infection was ranged from 1 to more than ten years.

This duration was 1-2 years in 7 cases, 2-4 years in 16 cases, 5-7 years in 11 cases, 8-10 and more than 10 years in 7 and 4 cases, respectively.

The statistical characteristics of the assessed variables in the experimental and control groups are presented in Table 3.

**Table 3.** The statistical characteristics of CD4 cells

Group	Pre-test		Post-test	
	Mean	Standard deviation	Mean	Standard deviation
Control	834.94	160.47	849.93	181.56
Mindfulness	861	167.65	1019.20	170.70
Spirituality therapy	858	168.81	993.20	177.62

The results of the Kolmogorov-Smirnov test indicated that all research variables have a normal distribution. The results of the Levene's test for F also point to the value that none of the variables is significant, and equality of variances is assumed to be established. In proportion to the assumption of homogeneity of

variances, the cross-correlation between dependent variables and regression slopes of CD4 variables, multivariate analysis of covariance was performed.

There was no significant difference between the control and experimental groups in the pre-test (Table 4).

**Table 4.** The results of covariance analysis for CD4 cells

Variable	Source of changes	Total squares	Degree of freedom	Mean squares	F	P	Coefficient effect
CD4 count	Pre-test	692102.45	1	692102.45	105.34	0.001	0.796
	Group	153823.25	1	153823.25	23.41	0.001	0.464
	Error	177386.89	27	6569.88	-	-	-

Based on the results, by controlling the effect of the pretest in CD4 count, there was a

significant difference between the experimental and control groups.

**Table 5.** The results of multivariate covariance analysis of spiritual therapy for CD4 cells

Variable	Source of changes	Total squares	Degree of freedom	Mean squares	F	P	Coefficient effect
CD4 count	Pre-test	722234.37	1	692102.45	107.75	0.001	0.80
	Group	107740.72	1	153823.25	16.07	0.001	0.373
	Error	180972.96	27	6702.70	-	-	-

The squares of eta ( $\eta$ ) values were revealed in Table 5 and shared variance for the new variable. The general rule is that if this value is greater than 0.14, the effectiveness of spiritual therapy has been high. Thus, the value of the new variable indicates the large effect of the

independent variable. Furthermore, the results of the Wilks's lambda test are also significant for the new variable and show that the participants of the two groups are different, and the independent variable influenced the means significantly.

**Table 6.** MANCOVA test to compare the experimental and control groups

Group	Dependent variable	Total squares	Degree of freedom	Mean squares	F	P	Coefficient effect
Control group	Post-test CD4	899010.81	1	899010.81	124.89	0.001	0.757
Mindfulness	Post-Test CD4	10.73	1	10.73	0.01	0.971	0.001
Spirituality therapy	Post-Test CD4	179049.73	2	89524.87	11.3	0.001	0.361

The results of Table 6 indicated that CD4 count in the post-test was different between the control group and the experimental groups ( $P < 0.05$ ). This finding revealed that using cognitive therapy based on mindfulness and

spiritual therapy has increased CD4 cells count. There was no significant difference between the control and experimental groups in the pre-test (Table 7).

**Table 7.** Tukey test for pair wise comparison of CD4 cells in post-test phase

Dependent variable	Group	Total squares	Degree of freedom	Mean squares	F
Pre-test CD4	Control group	Spirituality therapy		143.26	0.079
		Mindfulness		169.27	0.032
	Spirituality therapy	Mindfulness		26	0.915

## Discussion

This study aimed to assess the effectiveness of mindfulness-based stress reduction and spiritual therapy on increasing CD4 cells in AIDS patients. Based on the results, both treatments are effective to increase CD4 counts in these patients.

Psychological factors play an important role in the etiology and treatment of AIDS. Therefore, cognitive-behavioral interventions will decrease depression and anxiety and mutually increase the patients' quality of life. According to the findings, mindfulness-based stress reduction therapy has effectively increased CD4 cells in AIDS patients.

These findings are consistent with the results of the researches of Hamid et al. (22), Hashem Bachari (23), Seyed Alinaghi et al. (7), Hatch et al. (24), Zhang et al. (25), and Robinson et al. (26). Since psychological research has revealed that the CD4 cells rates have increased significantly up to 12 months compared to before starting treatment, so it can be concluded that the efficacy of MBSR on CD4 cells rate continues for at least one year, but with a decrease from the sixth month, re-holding of courses seems necessary (7).

The results of Hashem Bachari's study showed that MBSR educational, psychological interventions had a significant effect on reducing depression in patients with HIV/AIDS (23). Hamid et al. (22) also showed that MBSR has been effective in increasing the quality of life of chronic patients. The findings of this study show a 7.3% increase in AIDS patients' quality of lives. Furthermore, this increase has a significant effect on the condition of these patients (22).

MBSR is a behavioral intervention based on self-attention and concentration. Practices are performed by focusing on thoughts, feelings, and perceptions. These skills are achieved by focusing on breathing in all life activities. Evidence shows that MBSR has positive effects on physical and mental symptoms of AIDS patients (7); a study was also conducted on forty-seven HIV-positive people in which the activity and number of natural killer cells were much higher in the MBSR group. Furthermore, these results show that MBSR can effectively improve the immune status of HIV-infected people (26). Also, Hatch et al. showed that MBSR was effective in improving the symptoms of AIDS patients, and this effect was maintained in the 12-month follow-up (24).

Also, the result of the present study revealed that spiritual therapy increased CD4 cells in AIDS patients. This finding is based on the results of the researches conducted by Mohammadi and Rahimzadeh (27), Hamid and Veisi (28), Pirasteh and Nikmanesh (29), Mohammadpour et al. (30), Yu et al. (31), Carneiro et al. (32) Yates et al. (33).

Hamid and Veisi stated that semantic therapy is strongly influenced by cultural contexts, beliefs, values within the culture. Due to the religious context of Iran, the effectiveness of semantic therapy combined with the recitation of the Qur'an and praying on depression and CD4 + cells were examined on women with depression. The results revealed that signaling therapy had an effect on depression and CD4 cells (29).

Yu et al. (31) used spiritual therapy to cut the social stigma of AIDS patients, which reported satisfactory results. Carneiro et al. also showed that spiritual therapy and praying could be used as treatment resources for patients with HIV/AIDS (32). One of the main challenges in the life of every human being, namely the issue of death and how to react to this issue, especially in people with AIDS, which affects various aspects of their social, physical, mental, and spiritual life.

This infection can increase anxiety and fear in these people which exacerbate immune dysfunction (34). This study has some limitations such as the small sample size. Therefore, it is suggested that this research be performed on different types of these patients in different stages of the disease, and the results are compared.

## Conclusion

Based on the results, mindfulness-based stress reduction and spiritual therapy increased CD4 cells count in AIDS patients. In other words, these therapeutic approaches can be considered in patients with chronic diseases such as AIDS.

## Acknowledgments

This study is resulted from a Ph.D. dissertation of Islamic Azad University, Karaj Branch, with the code IR.IAU.K.REC.1397. The authors declare any financial support and conflict of interests. They thank all the faculty members of Karaj Islamic Azad University and the officials of the Welfare Organization, Shahriar Health Centers.

## References

1. Cane TP. Facilitating and supporting HIV+ parenthood: Lessons for developing the advocate role of voluntary HIV support services workers. *Sex Reprod Healthc* 2018; 16: 186-91.
2. Hall VP. Bearing witness to suffering in AIDS: The testing of a substantive theory. *J Assoc Nurses AIDS Care* 2015; 14(4): 25-36.
3. Shoko C, Chikobvu D. A superiority of viral load over CD4 cell count when predicting mortality in HIV patients on therapy. *BMC Infect Dis* 2019; 19(1): 169.
4. Gazda LS, Smith T, Watkins LR. Stressor exposure produces long-term reductions in a specific T and B cell responses. *Stress* 2003; 6(4): 259-67.
5. O'leary A. Stress, emotion, and human immune function. *Psychol Bull* 1990; 108(3): 363.
6. Naito A, Laidlaw TM, Henderson DC. The impact of self-hypnosis and Johrei on lymphocyte subpopulations at exam time: A controlled study. *Brain Res Bull* 2003; 62(3): 241-53.
7. Seyed Alinaghi A, Jam S, Imani A, Moradmand B, Ramezani A, Mohrez M. [The effect of "Consciousness -Based Stress Reduction" program on CD4 level in patients with AIDS/HIV: An experimental study]. *Iranian journal of infectious diseases and tropical medicine* 2009; 14: 61-4. (Persian)
8. Rezaei S, Khalatbari J, Kalthornigolkar M, Tajeri B. [Comparison of the effectiveness of two models of acceptance and commitment therapy and compassion focused therapy on psychological well-being and quality of life of individuals with human immunodeficiency viruses]. *Journal of health and care* 2020; 22(3): 245-56. (Persian)
9. Webb L, Perry-Parrish C, Ellen J, Sibinga E. Mindfulness instruction for HIV-infected youth: a randomized controlled trial. *AIDS Care* 2018; 30(6): 688-95.
10. Witek-Janusek L, Albuquerque K, Chroniak KR, Chroniak C, Durazo-Arvizu R, Mathews HL. Effect of mindfulness based stress reduction on immune function, quality of life and coping in women newly diagnosed with early stage breast cancer. *Brain Behav Immun* 2008; 22(6): 969-81.
11. Idrus MF, Jayalangkara J, Syamsu S, Ilham I. Spiritual psychotherapy effect to increase Cd4+ count in HIV/AIDS patients. *Nusantara medical science journal* 2016; 1: 25-32.
12. Mawarti H, Rajin M, Asumta MZ. Using spiritual relaxation as a nursing intervention to improve quality of life and CD4 cells in HIV/AIDS patient. *Journal of applied environmental and biological sciences* 2016; 6(10): 28-33.
13. Orive M, Barrio I, Orive VM, Matellanes B, Padierna JA, Cabriada J, et al. A randomized controlled trial of a 10 week group psychotherapeutic treatment added to standard medical treatment in patients with functional dyspepsia. *J Psychosom Res* 2015; 78(6): 563-8.
14. Zhao G, Ford ES, Li C, Tsai J, Dhingra S, Balluz LS. Waist circumference, abdominal obesity, and depression among overweight and obese US adults: National Health and Nutrition Examination Survey 2005-2006. *BMC Psychiatry* 2011; 11(1): 1-9.
15. Hamid N. [A comparative study on the effects of behavioral cognitive therapy and cognitive therapy with religious orientation on lymphocyte]. *Rooyesh* 2008; 12(1): 36-49. (Persian)
16. Ang RP, Jiaqing O. Association between care giving, meaning in life, and life satisfaction beyond 50 in an Asian sample: Age as a moderator. *Soc Indic Res* 2012; 108(3): 525-34.
17. Gall MD, Borg WR, Gall JP. *Educational research: An introduction*. London: Longman; 2003.
18. Pagana KD, Pagana TJ. *Mosby's manual of diagnostic and laboratory tests-e-book*. Philadelphia: Elsevier; 2017.
19. van Son J, Nyklíček I, Pop VJ, Pouwer F. Testing the effectiveness of a mindfulness-based intervention to reduce emotional distress in outpatients with diabetes (DiaMind): Design of a randomized controlled trial. *BMC Public Health* 2011; 11(1): 1-1.
20. Ghasemi Jobneh R. [The effectiveness of mindfulness training in reducing marital burnout in women with addicted spouses]. MS. Dissertation. Faculty of Psychology and Educational Sciences, Kharazmi University of Tehran, 2015. (Persian)
21. Ghasemiannejad Jahromi AN, Kajbaf MB, Ahmadi Forushani SH. [The effectiveness of spiritual and existential group therapy on the rates of depression, death anxiety and afterlife belief among students: A study based on the reports of people with death experience. *Knowledge and research in applied psychology* 2015; 16(4): 4-13. (Persian)
22. Hamid N, Bachari H, Attari YA. The effectiveness of Mindfulness Based on Stress Reduction (MBSR) on depression and quality of life in AIDS/HIV+ patients. *Jundishapur scientific medical journal* 2019; 17(6): 653-63. (Persian)
23. Hashem Bichari A. [The effectiveness of mindfulness-based psychosocial interventions on MBSR stress depression in AIDS and HIV patients]. National Conference on Modern Research in Psychology and Social Sciences, Tehran, 2016. (Persian)
24. Hecht FM, Moskowitz JT, Moran P, Epel ES, Bacchetti P, Acree M, et al. A randomized, controlled trial of mindfulness-based stress reduction in HIV infection. *Brain Behav Immun* 2018; 73: 331-9.
25. Zhang X, Liu D, Li Y, Zhang Y, Zhang B, Wang X, et al. Effects of mindfulness-based interventions on quality of life of women with breast cancer: a systematic review. *J Comp Eff Res* 2019; 8(11): 829-40.
26. Robinson FP, Mathews HL, Witek-Janusek L. Psycho-endocrine-immune response to mindfulness-based stress reduction in individuals infected with the human immunodeficiency virus: A quasi-experimental study. *J Integr Complement Med* 2003; 9(5): 683-94.
27. Mohammadi SY, Rahimzadeh K. [The effectiveness of therapy on spiritual health and quality of life of women with AIDS in Tehran]. *Health psychology* 2018; 7(1): 106-20. (Persian)

28. Hamid N, Veisi S. [Effectiveness of Logo therapy together with Quran recitation and prayers on treatment of depression and enhancing T helper Cell (CD4+)]. *Interdisciplinary Quran studied* 2013; 3(2): 27-38. (Persian)
  29. Pirasteh Motlagh A, Nikmanesh Z. [The role of spirituality in quality of life of patients with AIDS/HIV]. *Journal of Shahid Sadoughi University of Medical Sciences* 2013; 20(5): 571-81. (Persian)
  30. Mohammadpour A, Parsayekta Z, Nikbakht Nasrabadi AR. [Spirituality in HIV-infected individuals: A phenomenological study]. *Hayat* 2011; 17(2): 52-63. (Persian)
  31. Yu CH, Chiu YC, Cheng SF, Ko NY. HIV stigma and spiritual care in people living with HIV. *Hu Li Za Zhi* 2018; 65(3): 11-16. (Chinese)
  32. Carneiro ÉM, Borges RM, de Assis HM, Bazaga LG, Tomé JM, da Silva AP, et al. Effect of complementary spirits' therapy on emotional status, muscle tension, and wellbeing of inpatients with HIV/AIDS: A randomized controlled trial–single–blind. *Complement Integr Med.* 2018; 16(2): /j/jcim.2019.16.issue-2/jcim-2018-0057/jcim-2018-0057.xml.
  33. Yates T, Yates S, Rushing J, Schafer KR. Effects of religious involvement on HIV management outcomes among HIV-positive adults in central North Carolina. *South Med J* 2018; 111(10): 612.
- Ichikawa M, Natpratan C. Perceived social environment and quality of life among people living with HIV/AIDS in northern Thailand. *AIDS Care* 2006; 18(2): 128-32.