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Original Article

Comparing the effectiveness of acceptance and commitment therapy based on matrix and behavioral activation therapy on depression and quality of life

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Abstract

Introduction: This study aimed to compare the efficacy of group psychotherapy based on acceptance and commitment by matrix method and group behavioral activation therapy on depression and quality of life in depressed university students.

Materials and Methods: In this clinical trial, 45 university students with depression were selected during June and July 2018 and randomly divided in 3 groups (behavioral activation, group psychotherapy based on acceptance and commitment and the control). The experimental groups received 6 weekly sessions based on matrix acceptance and commitment and behavioral activation. All participants completed the Beck Depression Scale (BDI-II) and the WHO Quality of Life Questionnaire (WHOQOL-BREF) in three stages: pre-test, post-test, and one-month follow-up. Data were analyzed using multivariate covariance analysis.

Results: The results showed that matrix acceptance and commitment therapy and behavioral activation therapy have significant impacts on reducing symptoms of depression and increased quality of life. There was no significant difference between the two experimental groups in terms of depression (P= 0.411). The results also remained at a one-month follow-up.

Conclusion: It seems that group psychotherapy based on acceptance and commitment by matrix method and group behavioral activation therapy can decrease depression and increas quality of life in depressed university students.

Keywords: Acceptance and commitment therapy, Behavioral therapy, Depression, Quality of life

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Introduction

Mental health deprivation among university students is becoming a global problem, and depression is predicted to become the world's second most prevalent illness by 2020 (1). A systematic review of previous studies shows that university students have a higher rate of depression than the general population (2). A recent study showed a prevalence of depression among students of 35% (3). Throughout history, many theories have had different interpretations of depression. Psychological theories have tried to explain depression based on psychoanalysis and, in particular, in terms of attachment theories (4), behavioral models (5), cognitive models (6), stressful life events (7). Poor quality of life among students is associated with an unhealthy lifestyle, psychological distress, and academic failure (8). Malibary et al., in a study, showed that

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students with lower mental health had poor academic performance and low quality of life (8). In a similar study by Gan and Yuen Ling, students with depressive symptoms had lower physical, mental, and environmental quality of life (9). Given the sensitivity of this unique group that is the future makers of society, we need to consider the important issues and problems of psychological well-being in this part of society (10). It can be said that among the third generation psychology therapies, behavioral activation and acceptance and commitment-based therapy have been considered valuable treatments for emotional disorders due to their emphasis on eliminating avoidance and encouraging activity (11,12).

Despite the heterogeneity of experimental designs, most studies with acceptance and commitment therapy show improvement in participants' emotional state and quality of life (13). Acceptance and commitment-based therapy resulting from cognitive-behavioral therapy has shown encouraging results in treating emotional disorders (14). Research shows that acceptance and commitment-based therapy can increase social performance and quality of life through acceptance strategies and magnifying personal values (15). To reinforce acceptance and commitment-based therapy, the Matrix method has been introduced as a tool to help individuals identify their experiences as sensory or mental experiences and whether their behavior is valuable (forward) or away from experiences. Unwanted psychology (away) acts are used (16). The matrix encourages people to distinguish between actions that move in the direction of what is important and actions that are taken to get rid of internal suffering. This process helps to distinguish between the inevitable behaviors, which according to the Act model, are one of the primary sources of psychiatric disorders (17), and the activities that are the key to life in the Act (18). Also, studies have shown that behavioral activation therapy is useful in preventing and treating emotional problems (19).

A behavioral activation is a therapeutic approach that uses functional analysis and situation-related strategies to enhance the living environment for adaptive, healthy behavior and reduced behavioral avoidance. Behavioral activation therapy has found significant support for the treatment of depression and can be used in a wide range of settings and clinical populations (20). From what has been said, it has been observed that depression plays a very important role in mental health and all its related variables. As a result, treatment of this type of disorder is a priority of any treatment, and according to the contradictory results obtained in the treatment of depression according to the two treatment methods, this study aimed to compare the effectiveness of group psychotherapy based on acceptance and commitment using the matrix method with group behavioral activation therapy on depression. In addition, the quality of life of depressed students is necessary to evaluate more effective treatment.

Materials and Methods

The present study is a quasi-experimental design with pre-test, post-test, and control groups. The statistical population included all depressed students of Payame Noor University of Bandar Imam Khomeini who, between June and July 2018, voluntarily wanted to participate in the study. For this purpose, during the announcements shared in the university and cyberspace, then for selecting the subjects, the depressed students were first identified using Beck Depression Inventory and determining the cut-off point. Then 60 people were selected from the eligible people and randomly divided into three groups of 20 people. Of these three groups, two groups underwent intervention based on a brief guide to behavioral activation therapy for depression (21), matrix-based acceptance and commitment therapy (16), and 2-month follow-up, and one control group received no treatment. Eligible students were then invited to participate in the study.

During this period, the tool was implemented, and the treatment process began. Inclusion criteria: female students, having depression according to Beck Depression Inventory Second Edition and designated cut-off point (getting a score of 17 and above in Beck Depression Inventory-II), not receiving psychological or medication from 6 months before admission Having a minimum age of 18 and a maximum of 40 years and criteria for exclusion: unwillingness to participate in the study, no depression, the presence of other psychiatric disorders, the patient has a physical illness whose symptoms can be attributed to depression, substance abuse Narcotics, two sessions of absence from treatment sessions, as well as the ethical issues of participating in the

study, such as free entry and exit, the confidentiality of information, lack of any harm to the students participating in the study were explained. In the first session, a pre-test was performed on the pre-test group using two questionnaires (depression and quality of life). Then, the students participating in the study were exposed to 6 sessions of group therapy in two ways.

In the final session, a post-test was performed using the same questionnaires. Finally, the collected data were analyzed in pre-test and post-test by covariance test. After collecting data and demographic information and completing questionnaires by the participants in the study, the data were analyzed at both descriptive and inferential levels with the help of SPSS software version 23 at a significant level of $P< 0.05$.

Research instrument

A) The Beck Depression Questionnaire, The Second Edition (BDI-II): This questionnaire is a revised form of the Beck Depression Inventory, which has been developed to measure the severity of depression (22, 23). This tool also has 21 items scored using a four-point Likert scale (0 = basically up to 3 = severe), so the range of scores is between 0 and 63. The score of this tool is obtained by summing the score of the items, and a higher score means more depression. Beck and Clark reported its reliability by Cronbach's alpha method of 0.89.

The internal consistency of this questionnaire was also reported to be 0.91. Also, its internal consistency in Iran by Cronbach's alpha method is 0.94 (24-26). In the present study, Cronbach's alpha reliability coefficients for this questionnaire were calculated to be 0.91.

B) Quality of Life Questionnaire (BREF-WHOQOL): This questionnaire is a short form of a 100-question questionnaire, compiled after merging some areas and eliminating several questions and includes 26 questions. Physical Health Sub-Scale: Sum of scores of questions 3- 4- 10- 15- 16-17-18 in the questionnaire. The scores of these subscales will range from 7 to 35, and the difference between the two is 28. Mental Health Sub-Scale: Sum of scores of questions 5-6-7-11-11-19-26 in the questionnaire. The scores of this subscale will be between 6 and 30, and the difference between the two is 24. Social Interface Scale: Sum of scores of questions 20-21-22 in the questionnaire. The score range of this subscale will be between 3 and 15, and the difference between the two is 12. Environmental Health Sub-Scale: Sum of scores of questions 8-9- 12-13- 14- 23-24-25 in the questionnaire. The scores of this subscale will range from 8 to 40, and the difference between the two is 32. Quality of life and general health: Sum of scores of questions 1 and 2 in the questionnaire. The scores of this subscale will be between 2 and 10, and the difference between the two is 8. Cronbach's alpha was 0.82 for physical health, 0.81 for mental health, 0.80 for environmental health, and 0.68 for social relationships. The validity of this instrument was evaluated and reported as acceptable using two methods of differential validity and structural validity (27). Cronbach's alpha in all areas except social relations with 0.55 alpha was above 70%, which in general has good and acceptable validity and reliability for Iranians (37).

Table 1. Content and treatment sessions

Behavioral activation therapy	Acceptance and commitment treatment by matrix method
Session 1: Introduction, statement of session rules, explanation of depression, explanation of behavioral activation model, introduction and statement of goals, introduction of treatment logic	Session 1: Introducing, introducing the matrix and drawing the matrix, as an observer, paying attention to the five senses and mental experiences.
Session 2: Identification of alien behaviors and functional analysis, functional analysis of behaviors, review of the previous session	Session 2: Evaluating the long-term effectiveness of avoidance measures, scoring actions and introducing the vicious cycle.
Session 3: Functional analysis of behaviors, identification of stimuli that evoke behavior and stimuli that maintain behavior.	Session 3: Identifying thieves 'attention and problems with controlling internal events, introducing thieves' attention hooks and completing the hooks worksheet
Session 4: Review of the previous session, functional analysis and strengthening of effective coping methods, identifying values and activities related to them	Session 4: Teaching verbal aikido, accepting unpleasant feelings and avoiding conflict
Session 5: Functional analysis of behaviors, identification of stimuli that evoke behavior and stimuli that maintain behavior.	Session 5: Introducing Self-Compassion, an Opportunity for Compassion to Self-Compassion Self-Letter, Self-Compassionate Growth
Session 6: Summarizing and reviewing the content, strengthening the participants' activities to deal with depression	Session 6: Training and practicing vision by writing a letter from the future itself, controlling the power of vision

Results

As results in Table 2, in the ACT matrix group, single subjects were about 86.7%, and married subjects accounted for 13.3% of the samples. In the BATD group, single subjects were approximately 73.3%, and married subjects accounted for 26.7% of the samples. In the control group, single subjects were 86.7%, and married subjects accounted for 13.3% of the samples, but no significant differences were observed between the three groups (χ^2= 1.216, *P*= 0.504).

According to Table 2, In the ACT matrix group, the most frequent age groups (40%) belonged to 18-20 and 21–25 years. However, in the BATD group, the subjects in the age groups of 31 to 35 years old were the most (33.3%), and There was a significant difference between the three groups in terms of age groups (χ^2= 15.271, *P*= 0.018).

Before analyzing the data related to the hypothesis, the data were analyzed to ensure that the data of this study met the underlying assumptions of covariance analysis. For this purpose, quality of life was confirmed using the assumption of homogeneity (homogeneity) of variances, homogeneity of regression slopes, and the results of the Kolmogorov-Smirnov test on the assumption of the normal distribution of depressive scores. The assumption of the normal distribution of scores in the pre-test and all three experimental and control groups was confirmed. As shown in Table 3, the mean and standard deviation of depression and quality of life are presented in three stages: pre-test, post-test, and follow-up. The results of each group are given in Table 3 according to the matrix method of acceptance and commitment treatment and the behavioral activation group and the control group, respectively.

As shown in Table 3, in the follow-up phase with pre-test control, a significant difference was observed between depressed students in the experimental groups and the control group in terms of depression (*P*< 0.0001 and F= 35.04). Also, in the follow-up stage with pre-test control, there is a significant difference between depressed students in the experimental and control groups regarding the quality of life (*P*< 0.0001 and F= 21.22). The effect or difference is equal to 0.52; in other words, 52% of individual differences in quality of life follow-up scores are related to the continuation of the effect of treatment based on acceptance and commitment to the matrix method and behavioral activation (group membership). On the other hand, there was no significant difference between the two experimental groups (acceptance and commitment therapy and behavioral activation training) regarding depression (*P*= 0.411). This indicates the almost identical effect of matrix-based acceptance and commitment therapy and behavioral activation in the continuation of depression reduction.

According to Table 4, it can be seen that after controlling the pre-test scores, there is a significant difference between the post-test scores of depression between the three groups (F= 735.04, *P*= 0.001), and the people in the ACT and BATD groups obtained lower scores in the post-test than the control group. According to Table 4, it can be seen that after controlling the pre-test scores, there is a significant difference between the post-test scores of quality of life between the three groups (F= 21.682, *P*= 0.001), and the people in the ACT and BATD groups obtained higher scores in the post-test than the control group. According to Table 4, it can be seen that after controlling the pre-test scores, there is a significant difference between the follow-up scores of quality of life between the three groups (F= 19.281, *P*= 0.001), and the people in the ACT and BATD groups obtained higher scores in the follow up than the control group.

Table 2. Frequency of research participants in three research groups

Variables	Group	ACT	Behavioral activation	Control	χ^2	P
Marriage status	Married	13	11	13	1.216	0.504
	Single	2	4	2		
Age (Year)	18-20	6	4	4	15.271	0.018
	21-25	6	3	11		
	26-30	2	3	0		
	31-35	1	5	0		

Table 3. Mean ± SD of depression scores in the experimental and control groups in the pre-test, post-test, and follow-up stages

Variable	Groups	Statistical index	Mean ±SD
Depression	Pre-test	Acceptance and Commitment Therapy (ACT)	22.60±5.84
		Behavioral activation	26.93±7.22
		Control	28.53±7.21
	Post-test	Acceptance and Commitment Therapy (ACT)	11.67±6.49
		Behavioral activation	11.87±10.08
		Control	28.60±10.94
	Follow-up	Acceptance and Commitment Therapy (ACT)	8.73±6.36
		Behavioral activation	7.73±7.89
		Control	26.60±8.69
Quality of life	Pre-test	Acceptance and Commitment Therapy (ACT)	78.67±10. 50
		Behavioral activation	66.33±9.29
		Control	72±8.62
	Post-test	Acceptance and Commitment Therapy (ACT)	86.87±8.62
		Behavioral activation	77.53±9.77
		Control	71.60±10.30
	Follow-up	Acceptance and Commitment Therapy (ACT)	86.67±8.93
		Behavioral activation	79.60±9.81
		Control	71.47±8.86

Table 4. Comparing post-test and follow up scores among groups using ANCOVA

Variables	Source	Type III Sum of Squares	df	Mean Square	F	P	Partial Eta Squared
Depression (post-test)	Pre-test	30.56	1	30.56	0.697	0.409	0.129
	group	3071.08	2	1534.54	35.04	0.0001	1.000
	Error	1665.19	38	43.82			
Quality of life (post-test)	Pre-test	1478.15	1	1478.15	45.62	0.0001	1.000
	group	1317.51	2	658.75	21.22	0.0001	1.000
	Error	1179.48	38	31.03			

Discussion

This study aimed to compare the effectiveness of group psychotherapy based on acceptance and commitment by matrix method with group behavioral activation therapy on depression and quality of life of depressed students. The results show the almost identical effect of acceptance and commitment therapy (ACT) with the matrix method and behavioral activation training in reducing depression. Furthermore, the effectiveness of behavioral activation has been proven in several studies (28-34).

In the most extensive study to date comparing the effectiveness of depressive treatments (35), it was found that behavioral activation therapy had better results in the treatment of severely depressed patients than medication and cognitive therapy. It should be noted that these results are maintained for up to two years with follow-up. In Iran, group therapy of behavioral activation has effectively reduced the severity of depressive symptoms and changed dysfunctional attitudes of students (36). Behavioral activation interventions have been used primarily to treat depressive disorders and symptoms, and three meta-analyses support their effectiveness. Thus, behavioral activation is currently considered an experimental therapy prescribed for the treatment of depression (37).

In one more convincing study, behavioral activation with antidepressants medicine was superior to cognitive therapy in treating major depression, with results maintained at two years' follow-up (36). A recent study examining the relative effectiveness of brief behavioral activation and problem-solving therapy in treating depressed breast cancer patients showed that both in a wide range of outcomes assess depression, environmental reward, anxiety, quality of life, social support, and medical outcomes were effective treatments (38). Approximately two-thirds of the patients had a clinically significant improvement in both methods. The most important achievement of treatment was the 12-month follow-up.

In addition to these studies, behavioral activation has been used effectively with depressed patients among samples with various medical and psychiatric problems (38). The first recent meta-analysis focused on evaluating the effectiveness of activity planning as behavioral therapy for depression. In a review of 16 studies, the magnitude of the interaction showed a significant difference between

activity planning and control conditions after treatment.

Comparison with other post-treatment psychological therapies results had significant effects in favor of activity planning. In ten studies that compared activity planning with cognitive therapy, the magnitude of the interaction was not significant. Most importantly, changes from treatment to follow-up were impossible to plan activities, indicating that the benefits of treatment are maintained in follow-up. In the second meta-analysis of 17 randomized controlled trials including behavioral interventions, post-treatment symptom assessment showed that behavioral activation therapy was superior to other treatments. Finally, in the third meta-analysis, which evaluated the effect of behavioral activation therapy on mental satisfaction and life satisfaction, the size of the interaction in twenty studies showed a significant difference in health between behavioral activation and control conditions after treatment (36).

This significant effect was also found for non-clinicians and people with high depressive symptoms. These three meta-analyses strongly support the effectiveness of behavioral activation as a treatment for depression and suggest that it is a relatively uncomplicated and effective approach for many patients, including those with major depression (36). Analysis of the research hypothesis results showed that there is no significant difference between the two treatments, and both treatments have the same effectiveness in increasing the quality of life of students. It is noteworthy that such a hypothesis has not been put to experimental experiment so far in the research literature, so we can refer to similar studies to strengthen this section. It can be said that many researches have been done with these two therapeutic approaches on the quality of life variable, but no significant studies have been done in the field of students. Therefore, according to research related to treatment based on acceptance, commitment, and quality of life in samples beyond students, the effect of the act can be investigated. Therefore, the results obtained from the findings have confirmed the effect of treatment based on acceptance and commitment and behavioral activation on quality of life (12-15). Alijanzadeh Tonekaboni et al. conducted a comparative study of the effectiveness of behavioral activation training and acceptance and commitment-based training on increasing the psychological well-being of ninth grade male students in high schools in Kerman**.** Findings showed that acceptance and commitment intervention is more effective than behavioral activation in increasing psychological well-being. Furthermore, the results showed a difference between behavioral activation training and acceptance and commitment training in increasing students' psychological well-being (39).

According to Gonzalez et al. study, act therapy has better results than cognitive-behavioral therapy in the long run (14). Furthermore, considering the effect of treatment based on acceptance and commitment to anxiety (28) and depression and other psychological symptoms, improving psychological symptoms can increase patients' quality of life. In the theoretical explanation of these findings, it should be stated that commitment and acceptance education should be involved in and accept and accept the ideas that were previously sought to be avoided by increasing cognitive failure and conscious acceptance. Furthermore, reducing physical pain, avoiding dysfunctional thoughts, and using their energy to move towards values rather than fighting dysfunctional thoughts leads to an increase in the quality of life of patients with depression (30).

Since the acceptance and commitment treatment has been done by the matrix method, an explanation according to this method can be considered for the effectiveness, in the sense that the matrix is the first and most important way to create a practical conceptual perspective. The matrix describes the concepts of interest that include inner experience, suffering, and values, which make it the center of performance ability because it sorts behaviors in terms of their efficiency in moving toward what they are. In addition, the matrix draws attention to the clinical aspects related to the field of interest: factors that play a role in maintaining problem-solving behavior and factors that can contribute to value-based flexible behavior (16).

The matrix encourages people to distinguish between actions that move toward what is important and actions that are taken to get rid of internal suffering. This process helps to distinguish between the inevitable behaviors, which according to the act model, are one of the primary sources of psychiatric disorders (17), and the activities that are the key to life in the

act are meaningful (18). According to what was said, the results of this study showed the effectiveness of behavioral activation therapy in reducing depression and increasing the quality of life of depressed students even up to the follow-up stage. Therefore, the results of the studies such as are in line with the findings of this study. Contrary to the findings of this study, McIndoo et al. performed two therapies of mindfulness and behavioral activation on depressed students, which in the post-test of two experimental groups of mindfulness and behavioral activation compared to the control group showed less depression. Also, mindfulness-based psychotherapy showed better results than behavioral activation therapy (40). The explanation for the effectiveness of behavioral activation therapy in reducing depression can be stated that, according to behavioral theories, one of the behavioral causes of depression is disruption of order in daily activities (21).

Behavioral activation therapy regulates daily activities, which regulates sleep and wakefulness, increases patient activity, and participates in social activities. Thus, part of the symptoms of depression, namely sleep disorders and lack of interest in enjoyable participation, disappear. Also, because depressed people often feel tired and lack the motivation to perform various activities, this treatment causes them to have more energy and positive thinking. In such situations, they can perform activities that were previously performed. Therefore, ignoring them or not being able to do so increase the quality of life of depressed people. In this research process, some shortcomings were observed that could be referred to the statistical population of this study, which were female students. Due to individual, social and intercultural differences, this issue limits the generalizability of the findings. The novelty of using the concept of acceptance and commitment therapy by act matrix method in education and treatment is another limitation of this research. In this study, we tried to prevent the intervening variables by using factors such as age, sex, and educational level, limiting the generalization of the findings. Based on the shortcomings observed in the current study, it is suggested that: Considering that the present study was conducted only on female students, it is recommended that this study be performed on male students, and its findings should be reviewed. It is suggested that in future therapeutic research, other groups with drug therapy and placebo should be studied along with the experimental and control groups to allow further comparisons. Also, in future research, this study should be performed on clinical and non-student samples. It is worthwhile to repeat this research in various social, economic, cultural, etc., groups. It is worthwhile to conduct this research comparatively with other methods simultaneously and compare the findings.

Conclusion

In conclusion, the effectiveness of group psychotherapy based on acceptance and commitment by matrix method with group behavioral activation therapy has a significant effect on increasing quality of life and reducing symptoms of depression in depressed females.

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