

Effectiveness of Acceptance and Commitment Therapy (ACT) on Anxiety, Depression, and Flexibility of Patients with Asthma

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Abstract

Asthma is one of the rapidly spreading diseases. The present study aims to investigate the effectiveness of acceptance and commitment therapy (ACT) on anxiety, depression, and flexibility of patients with asthma. This research is an empirical field study whose population consists of all patients with asthma in Kashan-Iran in First Semester 2014, from which 40 people were selected using the sampling method and randomly divided into two control and experimental groups. Subjects in the experimental group received the intervention; then, both groups were post-tested. Pre-test and post-test data were collected using the depression inventory developed by Beck [10], the anxiety inventory developed by Beck et al [10] and the AAQ-II questionnaire (for assessing the flexibility) developed by Hayes et al. (2004). The face validity of questionnaires was confirmed by a number of patients with asthma in a pilot study. The reliability of depression and AAQ-II questionnaires were determined equal to 0.76 and 0.61, respectively using the Cronbach's alpha coefficient. Also, the reliability of anxiety inventory was determined equal to 0.60 using both the Cronbach's alpha and the split-half method. The research data were analyzed using the covariance analysis test. The results of this study showed that this therapy has a significant effect on anxiety, depression, and flexibility of patients with asthma, so that it reduced the anxiety and depression of patients and increased their mental flexibility. Also, follow-up after one month showed that the impact was significant. The results also indicated that this method can be considered as a desired therapeutic option in comparison to other treatments and can provide a significant improvement through its processes.

Keywords: acceptance and commitment therapy (ACT), anxiety, depression, flexibility, asthma

Introduction

Asthma is a chronic disease of the respiratory system which has a profound impact on the life and performance of people suffering from it and affects group activities, social and psychological functioning, and even economic progress of patients. Unlike the term "Acute" which implies treatable diseases with a relatively short treatment period, the term "Chronic" implies a long period of illness and a condition that is sometimes non-curable. In such diseases, long period of illness makes follow-up and treatment very difficult for patients and affects their performance. The main action in the treatment of asthma is to remove tracheobronchial obstruction and inflammation, because persistent, constant, and progressive breathlessness leads to increased anxiety and worsens the diseases; hence, increased anxiety is an alarm to the worsening of the disease; and since most physical ailments are associated with anxiety and depression, the present research aims to help to reduce anxiety and depression in these patients and thereby accelerate the healing process and prevent worsening of the disease [2]. Asthma is accompanied with psychological

symptoms such as depression, discomfort, and anxiety. According to many studies, patients with asthma in most communities suffer from psychological problems, so that the majority of them have a history of depression, anxiety, and stress [19]. In a study conducted by Poitras et al. (2009), it was found that there is a positive relationship between “depression and anxiety” and dyspnea. Depression is a syndrome dominated by depressed mood and shown based on the verbal and nonverbal expression of sad and anxious emotions or arousal states [3]. Depression, like other emotions is along with physiological and biological changes; and anxiety is a condition characterized by feelings of fear and accompanied with physical symptoms indicating increased activity of the autonomic systems (such as palpitations and sweating). Anxiety affects cognitive performance and causes perceptual distortions [4]. Anxiety is often caused by new experiences and may be perceived as a threat to one’s identity and self-esteem. In fact, anxiety and depression have an influential effect and can reduce the ability of patients to cope with physical symptoms and chemotherapy. Anxiety and depression combined with a chronic medical disease leads to an increased risk of death and health care costs, deteriorating quality of life, and functional disability [16]. In addition to anxiety and depression, people with this disease have low psychological flexibility. Actually, psychological flexibility plays an important role in the incidence of pathology and social performance level. According to new definitions, flexibility is success in coping with stressful situations, which finds meaning in two dimensions: emotional and behavioral [18]. In addition, there is a significant relationship between flexibility and symptoms of anxiety, depression, and anti-social behaviors [5]. Many psychological treatments (with an emphasis on emotions and cognitions) have been used for reducing the psychological disorders of patients such as depression, anxiety, stress, etc., but according to the Third Wave of psychotherapies which is known as postmodern psychotherapies, it is believed that cognitions and emotions should be considered in the context of conceptual phenomena; in other words, instead of changing the form, frequency, or situational sensitivity of cognitions and emotions, their function is targeted.

Acceptance and commitment therapy (ACT) is a Third Wave therapy with six central processes leading to psychological flexibility. These six processes include acceptance, diffusion, self as context, attention to the present moment, values, and committed action (Hayes et al., 2006). Acceptance and commitment therapy mainly focuses on changing the function of thoughts and emotions instead of changing their form, content, or frequency. Although the effectiveness of this therapy in reducing symptoms of anxiety and some physical and mental diseases has been approved, so far, no research has investigated its impact on three simultaneous variables including anxiety, depression, and flexibility of patients with asthma. Anyhow, in the case of being effective, the therapy can be used to reduce psychological problems (anxiety, depression, etc.) of asthma and thereby prevent the heavy financial and psychological burdens of this disease from being imposed on patients and their families. Also, considering the significant correlation between “flexibility” and “anxiety and depression” as well as the impact of flexibility on patients’ way of coping with life events [13], the present research can be important to help increase psychological flexibility through acceptance and commitment therapy.

Arash et al. (2010) in a study as “The impact of asthma on patients’ performance” reported that most participants were female, married, and nonsmokers. The results of this study showed a significant relationship between “age and marital status” and “mental function”, between “education level” and “social, economic, and psychological performance”, between “duration of illness” and “social performance”, between “history of addiction” and “mental function”, and between “asthma severity” and

“social performance”. However, no significant relationship was observed between “asthma severity” and “mental and economic function” as well as between “patients’ gender and hospitalization frequency” and “patients’ functional aspects”.

Mohammadian [8] conducted a study as “Comparison of mental health and coping strategies for stress in patients with asthma and normal subjects”. The results of this study showed that people with asthma had lower mental health compared to normal subjects and their depression, anxiety, insomnia, and physical symptoms scores were higher.

Qaraei A. et al. [6] investigated the effectiveness of acceptance and commitment therapy in reducing the severity of pain experienced by women with chronic headache disorder. The results of this study showed that acceptance and commitment therapy is effective in reducing the severity of pain experienced by women suffering from chronic headache disorder.

Nematzadeh [9] conducted a study as “Comparison of life quality and early maladaptive schemas among asthmatic and dialysis patients and normal individuals”. The results of this study showed that the group of asthmatic and dialysis patients got higher scores regarding the early maladaptive schemas (including disconnection and rejection, impaired autonomy and performance, impaired limits, other-directedness, over vigilance, inhibition) in comparison to the healthy group. Also, the asthmatic and dialysis patients’ quality of life was lower than the health ones.

Mohareri et al [7] conducted a study as “The levels of overt and covert anxiety and depression in patients with asthma and obstructive pulmonary”. The results of this study showed that both groups suffered from significant anxiety and depression, so that 52% and 6% of samples respectively had mild and severe depression as well as 51.9% and 28.1% of them respectively suffered from a medium to high and severe anxiety.

Kutner et al [17] conducted a study as “Functional impairment, depression, and life satisfaction among older asthmatic patients”. The results of this study showed that mental health problems reduce the quality of life in patients with asthma. Also, they showed that the quality of life in female patients with asthma was significantly lower than the male ones.

Goldfarb (2010) has particularly examined two control and experimental groups in terms of the effectiveness of acceptance and commitment therapy on public speaking anxiety which is a form of social anxiety. The research evidence suggests increased psychological flexibility in the experimental group.

Sayin et al [20] conducted a study as “Quality of life in asthmatic, peritoneal dialysis, and transplant patients” and concluded that assessing quality of life helps the medical team to understand patients’ perception of health, functional ability, and sense of well-being and take into consideration treatment methods improving the quality of life for patients.

Fennel [11] investigated psychosocial aspects of care of children with moderate renal failure. The results showed that patients with asthma have inconsistency problem in coping with psychosocial issues and physical signs of body.

Stekette et al. (2013) studied the effectiveness of acceptance and commitment therapy on anxiety and depression in women. The results of this study showed that changes in accepting and acting upon values during the therapy can predict changes in anxiety and depression after the therapy.

The research hypotheses

The main hypothesis: acceptance and commitment therapy (ACT) affects the anxiety, depression, and flexibility of patients with asthma.

The secondary hypotheses

- 1- Acceptance and commitment therapy (ACT) affects the anxiety levels of patients with asthma.
- 2- Acceptance and commitment therapy (ACT) affects the depression levels of patients with asthma.
- 3- Acceptance and commitment therapy (ACT) affects the levels of psychological flexibility in patients with asthma.

The research methodology

In this research, the convenient or available sampling technique has been used to select samples from the population which consists of all patients with asthma in Kashan-Iran in First Semester 2014. In this regard, firstly, a number of asthmatic patients attending Shahid Beheshti hospital and Pulmonary and Respiratory Center in Kashan-Iran filled questionnaires for depression, anxiety, and flexibility; then, 40 of these respondents with high scores on depression and anxiety questionnaires and low scores on flexibility were selected and randomly divided into two control and experimental groups. In this study, due to the risk of sample loss and also increasing the external validity, the sample size was considered to be equal to 20 people in each group. The research data collection tool has been questionnaires; in this way that after acquiring the necessary permits, firstly, the researchers visited Shahid Beheshti hospital and two Pulmonary and Respiratory clinics in Kashan-Iran; then, they selected the samples and divided them into two control and experimental groups; later, the research objectives were explained to samples and the questionnaires for depression, anxiety, and flexibility were distributed among them. Afterwards, the experimental group received the intervention and the control group remained without any intervention; and after completion of the intervention, both groups refilled the questionnaires; finally, the questionnaires were collected and their data analyzed using the SPSS software.

Findings

The first hypothesis: acceptance and commitment therapy (ACT) affects the anxiety, depression, and flexibility of patients with asthma in the post-test and follow-up stages.

Table 1: the results of Levene's test

Variables	F	Degrees of Freedom 1	Degrees of Freedom 2	Significance Level
Anxiety	1.086	5	114	0.077
Depression	1.367	5	114	0.091

PsychologicalFlexibility	1.002	5	114	0.109
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According to table 1, the significance level (P-value) of Levene's test shows that the variances are equal ($P > 0.05$).

Table 2: the results of Kolmogorov–Smirnov test to determine the normality of distribution of variables “anxiety, depression, and psychological flexibility”

Statistic	Anxiety		Depression		Flexibility	
	Control	Experimental	Control	Experimental	Control	Experimental
Kolmogorov-Smirnov Test(Z- value)	1.09	0.19	1.11	1.01	1.17	0.96
Significance Level	0.094	0.077	0.103	0.124	0.084	0.143

According to table 2, the significance level of the test error is higher than 0.05 at the confidence level of 0.95; hence, it is concluded that the distribution of variables “anxiety, depression, and psychological flexibility” is normal in both control and experimental groups and parametric tests (covariance) should be used for the analysis of hypotheses.

Table 3: results of the significance test for MANCOVA (Multivariate Analysis of Covariance)

Model	Tests	Values	F	Hypothesis df	Error df	P	Eta-squared
	Model	Pillai's Trace	0.324	17.907	3.000	112.000	0.000
Wilks' Lambda		0.676	17.907	3.000	112.000	0.000	0.324
Hotelling's Trace		0.480	17.907	3.000	112.000	0.000	0.324
Error Largest Root		0.480	17.907	3.000	112.000	0.000	0.324
Post-test Group*	Pillai's Trace	0.623	17.024	6.000	226.000	0.000	0.311
	Wilks' Lambda	0.380	23.199	6.000	224.000	0.000	0.383
	Hotelling's Trace	1.621	29.992	6.000	222.000	0.000	0.448
	Error Largest Root	1.616	60.885	3.000	113.000	0.000	0.618

According to table 3, the significance level of all tests allows the use of multivariate analysis of variance. These results also show that there is a significant difference between groups under study at least for one of the dependent variables (Wilks' Lambda=0.38, $F=23.19$, $P < 0.05$). Also, the value of eta-squared shows that the difference between groups with respect to dependent variables is totally significant and based on the Wilks' Lambda test, the magnitude of this difference is equal to 0.38; namely, 38% of the variance of the difference between groups is due to the interaction of the dependent variables.

Table 4: the results of multivariate analysis of covariance (MANCOVA) on variables “anxiety, depression, and psychological flexibility”

Source of Variation	Dependent Variables	Sum of Squares	df	Mean Squares	F	P	Eta	Statistical Power
Model	Anxiety	92907.675	1	92907.675	964.075	0.000	0.894	0.711
	Depression	60076.875	1	60076.875	1269.124	0.000	0.918	0.799

	Psychological Flexibility	180187.500	1	180187.500	7021.972	0.000	0.984	0.823
Post-test Group*	Anxiety	622.850	2	311.425	3.232	0.043	0.054	0.041
	Depression	1341.217	2	670.608	14.167	0.000	0.199	0.188
	Psychological Flexibility	886.200	2	443.100	17.268	0.000	0.233	0.216

According to table 4, there is a significant difference between control and experimental groups at pre- and post- treatment and follow-up regarding mean of anxiety, depression, and psychological flexibility ($P < 0.05$). Thus, it can be said that the main hypothesis of the research is confirmed and acceptance and commitment therapy (ACT) affects the anxiety, depression, and flexibility of patients with asthma; in other words, ACT can reduce the anxiety, depression, and flexibility of patients with asthma.

The second hypothesis: acceptance and commitment therapy (ACT) affects the anxiety levels of patients with asthma in the post-test and follow-up stages.

Table 5: the results of Levene's test

F	Degrees of Freedom 1	Degrees of Freedom 2	Significance Level
1.086	5	114	0.077

According to table 5, the significance level (P-value) of Levene's test shows that the variances are equal ($P < 0.05$).

Table 6: the results of covariance analysis test

Source of Variation	Sum of Squares	df	Mean Squares	F	Significance Level	Eta-squared	Statistical Power
Model	92907.675	1	92907.675	964.075	0.000	0.894	0.711
Anxiety	210.675	1	210.675	2.186	0.142	0.019	0.129
Post Test	951.650	2	475.825	4.937	0.009	0.380	0.462
*Post-test Anxiety	622.850	2	311.425	3.232	0.043	0.254	0.196

According to table 6, since the value of F-statistic is equal to 3.23 as well as the significance level of the test error is lower than 0.05 at the confidence level of 0.95, it can be said that the second hypothesis is confirmed and acceptance and commitment therapy (ACT) affects the anxiety levels of patients with asthma; in other words, ACT can reduce the anxiety of patients with asthma.

The third hypothesis: acceptance and commitment therapy (ACT) affects the depression levels of patients with asthma in the post-test and follow-up stages.

Table 7: the results of Levene's test

F	Degrees of Freedom 1	Degrees of Freedom 2	Significance Level
1.367	5	114	0.91

According to table 7, the significance level (P-value) of Levene's test shows that the variances are equal ($P < 0.05$).

Table 8: the results of covariance analysis test

Source of Variation	Sum of Squares	df	Mean Squares	F	Significance Level	Eta-squared	Statistical Power
Model	60076.875	1	60076.875	1269.124	0.000	0.918	0.799
Depression	4.408	1	4.408	0.093	0.761	0.001	0.011
Post Test	1468.050	2	734025	15.506	0.000	0.214	0.206
*Post-test Depression	1341.217	2	670.608	14.167	0.000	0.199	0.187

According to table 8, since the value of F-statistic is equal to 14.16 as well as the significance level of the test error is lower than 0.01 at the confidence level of 0.99, it can be said that the third hypothesis is confirmed and acceptance and commitment therapy (ACT) affects the depression levels of patients with asthma; in other words, ACT can reduce the depression of patients with asthma.

The fourth hypothesis: acceptance and commitment therapy (ACT) affects the levels of psychological flexibility in patients with asthma in the post-test and follow-up stages.

Table 9: the results of Levene's test

F	Degrees of Freedom 1	Degrees of Freedom 2	Significance Level
1.002	5	114	0.109

According to table 9, the significance level (P-value) of Levene's test shows that the variances are equal ($P > 0.05$).

Table 10: the results of covariance analysis test

Source of Variation	Sum of Squares	df	Mean Squares	F	Significance Level	Eta-squared	Statistical Power
Model	180187.500	1	180187.500	7021.972	0.000	0.984	0.823
Psychological Flexibility	874.800	1	874.800	34.091	0.000	0.230	0.216
Post Test	936.200	2	468.100	18.242	0.000	0.242	0.229
*Post-test Psychological Flexibility	886.200	2	443.100	17.268	0.000	0.233	0.219

According to table 10, since the value of F-statistic is equal to 17.26 as well as the significance level of the test error is lower than 0.01 at the confidence level of 0.99, it can be said that the fourth hypothesis is confirmed and acceptance and commitment therapy (ACT) affects the levels of psychological flexibility in patients with asthma; in other words, ACT can increase the psychological flexibility of patients with asthma.

Discussion and Conclusion

The present study aimed to investigate the effectiveness of acceptance and commitment therapy (ACT) on anxiety, depression, and psychological flexibility of patients with asthma. In this research, the patients had previously received a diagnosis of asthma based on the opinions of specialist physicians. The main

and general hypothesis of this research proposed that acceptance and commitment therapy (ACT) affects anxiety, depression, and psychological flexibility of patients with asthma. The results of testing this hypothesis led to the confirmation of it; in other words, acceptance and commitment therapy (ACT) affects anxiety, depression, and psychological flexibility of asthmatic patients; namely, ACT can reduce anxiety, depression, and psychological flexibility of patients with asthma. These results are consistent with the results of studies conducted by Goldfarb (2010) and Sayin et al [20]. In the explanation of these results, it should be stated that the research general hypothesis was separately explained by three secondary hypotheses. Accordingly, the second hypothesis (the first secondary hypothesis) of the research investigated the effectiveness of acceptance and commitment therapy (ACT) on anxiety levels of patients with asthma. The results of testing this hypothesis showed that acceptance and commitment therapy (ACT) affects anxiety levels of asthmatic patients; in other words, acceptance and commitment therapy (ACT) can reduce the anxiety levels of patients with asthma. Also, the impact was significant at follow-up after one month. This result is consistent with the results of studies conducted by Arash et al. (2010), Mohammadian [8], Mohareri et al. [7], Goldfarb (2010), and Sayin et al [20]. In the implications of these results, it can be stated that asthma is always a cause of stress and anxiety for patients suffering from it; also, this disease makes most of situations anxiogenic for the patients, so that the results indicate a high prevalence of anxiety among them. In the meantime, using diffusion and ACT techniques can reduce the annoyance of anxiogenic situations for patients. Although this therapy does not directly target the frequency and content of thought in patients with anxiety, it reduces the anxiety through using diffusion and ACT techniques as well as detailed discussions concerning the acceptance of the thoughts and feelings associated with asthma and personal values related to it and focusing on capabilities that enable patients to experience feelings in anxiogenic situations caused by the disease. In fact, this treatment instead of focusing on coping with the disease, tries to increase the individual willingness to experience an inner event as it is. Here, the goal is to help the individual to experience a thought of schemas just as a thought and instead of responding to it, do what is important in life and in line with values. This factor can reduce the anxiety of patients. The third hypothesis of the research suggested that acceptance and commitment therapy (ACT) can reduce the depression levels of patients with asthma. The results showed that the difference between the adjusted means of the two groups was statistically significant at the post-test stage; in other words, this therapy has a significant effect on the reduction of depression in patients with asthma at the post-test stage. These results are consistent with the studies conducted by Arash et al. (2010), Mohammadian [8], and Stekette et al. (2013). Asthmatic patients due to the problems of this disease have high rates of depression. According to the self-perception theory, depressed people think that they are so unworthy and alone; and at the same time, they think that the world is full of onerous demands and obstacles that do not allow them to reach their goals. Depressed people have a sad look to the future and believe that their problems will become more severe and they will not succeed; such a perception makes them hesitant, frustrated, tired, and indifferent [10]. and the disease intensifies these thoughts and feelings. In the meantime, according to the ACT, it is firstly attempted to increase psychological acceptance of subjective experiences (thoughts and feelings related to illness and depression) in patients and correspondingly reduce ineffective control measures. The patient is taught that any action to avoid or control these unwanted subjective experiences is ineffective or has negative effects and exacerbates them and these experiences should be completely accepted without any external or internal reaction to remove them. Also, according to this therapy, it is attempted to increase the mental awareness of the present moment in patients; namely, the person becomes aware of all his mental states, thoughts and behaviors in

the present moment and is taught to make himself separated from these subjective experiences (separation of cognition), so that he can be able to act independently of the experiences. Finally, ACT trainings help individuals understand their core personal values and clearly identify them and convert them into specific behavioral goals (values clarification) [12]. Eventually, the fourth hypothesis investigated the impact of ACT on the levels of psychological flexibility in patients with asthma. The results of testing this hypothesis suggested that the therapy has a significant effect on increasing the levels of psychological flexibility in patients with asthma at the post-test stage. Also, the impact was significant at follow-up after one month. In fact, this therapy has not done directly on the flexibility of a particular group, but the results of the study conducted by Qaraei A. et al [6] in this regard show the impact of this therapy on increasing the flexibility. In explanation of these results it should be stated that the main theoretical construct of ACT is psychological flexibility meaning the ability to take effective action in line with individual values despite the presence of damage, illness and pain. The results of this research demonstrate the importance of psychological acceptance, especially in the case of psychological functions. Patients who report a greater tendency to negative psychological and emotional experiences as well as undesirable thoughts and memories show better social, physical, and emotional performance. Many studies have shown that avoidance of experiences is associated with a wide range of behavioral and psychological problems; in fact, avoidance of experiences makes people more vulnerable to stressors. People who are more willing and ready to trap and suppress such experiences are more likely to be disturbed when they try to control their stress and anxiety. Hayse [14] also believes that ACT approach instead of focusing on resolving and removing harmful factors (such as damages caused by the disease) help patients to accept their controlled emotions and cognitions and rid themselves of controlling verbal rules which have caused their problems; also, it allows them to abandon their struggle and conflict. ACT is essentially process-driven and clearly emphasizes the enhancement of psychological experiences acceptance and commitment with increasing meaningful, flexible, and adaptive activities regardless of the content of psychological experiences, a feature that is not present in the cognitive-behavioral approach. In addition, the therapies used in ACT are not limited to increasing realistic, effective, and rational thinking or encouraging feelings, but the objectives of this therapy are based on reducing the avoidance of these psychological experiences and increasing the awareness of them, especially focusing on the present moment without taking a struggling and non-evaluative way. Also, the therapies of ACT approach make changes in ways that psychological experiences affect the behavior to focus on changing the content of these experiences [21]. This process teaches the patient to keep themselves away from the pain and turmoil modes to reduce the impact of these experiences on behavior. Actually, the main goal of this therapy is to improve performance by increasing the level of psychological flexibility.

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