

# The Efficacy of Acceptance and Commitment Therapy (ACT) Matrix on Depression and Psychological Capital of the Patients with Irritable Bowel Syndrome

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## Abstract

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**BACKGROUND:** Irritable bowel syndrome (IBS) is one of the most common functional gastrointestinal disorders, worldwide. Psychological disorders are common among patients with IBS.

**AIM:** This study aims to investigate the efficacy of acceptance and commitment therapy (ACT) matrix on depression and psychological capital of patients with IBS.

**MATERIAL AND METHODS:** In a quasi-experimental study, a total number of 30 patients with IBS were selected using convenience sampling. Those patients who meet the inclusion criteria were randomly assigned to control and experimental groups (15 patients in each group). Data were collected using the Beck Depression Inventory (BDI) and the Psychological Capital Questionnaire (PCQ). The experimental group was subjected to the acceptance and commitment therapy (ACT) matrix, but the control group do not receive this treatment. Questionnaires were completed before (pre-test) and after (post-test) the intervention by patients in two groups. All patients in two groups responded to the questionnaires and returned them to the researcher. Data were analyzed using chi-square test, independent t-test, analysis of covariance (ANCOVA) and multivariate analysis of covariance (MANCOVA).

**RESULTS:** Analyzing the data showed that there were significant differences regarding depression and psychological capital between experimental and control group, before and after the study ( $p < 0.05$ ).

**CONCLUSION:** Using ACT matrix is a useful modality to improve the depression and psychological capital among patients with IBS.

## Introduction

Irritable bowel syndrome (IBS) is one of the most common functional gastrointestinal disorders which is characterised by bloating, abdominal pain or discomfort and mixed symptoms of constipation or diarrhoea [1], [2]. Other digestive symptoms of this disorder consist of abdominal distension, early satiety and dyspepsia. Non-digestive symptoms of this disorder consist of a chronic and migraine headache, menstrual pains, chronic fatigue, backache, agitation and depression [3]. There are several hypotheses about the aetiology of this disorder, but almost none of them is accepted by all. Also, none of the therapeutic approaches to this disorder such as drug therapy, diet therapy and psychological therapy were completely

successful or ineffective [4]. In one hand, uncertainties regarding the best treatment approach to IBS and on the other hand, an expansion the field of psychology of health attract the attention of researchers with a psychological approach. It has been demonstrated that psychological disorders don't cause IBS directly, but they affect the feeling of pain, duration and influence of suffering IBS [5]. Depression, as a psychological disorder, is one of the common comorbid diseases in patients with IBS. Depression is a state of mind that is associated with a reduction of self-esteem, sense of incompetence and wrong perception of oneself [6]. Depression is the natural response of human beings to the pressures of life. Depression is considered abnormal only when it is not fit with the incident that has happened or continues beyond the point which is a starting point for most people. Many environmental stressing stimuli such as

financial problems, new jobs, legal issues, retirement or other changes can contribute to the development of depression [7], [8], [9]. Previous studies showed that there is a relationship between depression and IBS. The results of a study which were done in 3153 IBS patients showed that 30.5% of the patients with IBS suffered from depression [10]. Also, it was shown that there is a significant relationship between depression and occurring of symptoms and their severity in patients with IBS [11]. Also, it was shown that anxiety is significantly higher in people suffering IBS, in comparison to healthy people [10], [11].

On the other hand, psychological capital is one of the components in health psychology. Psychological capital is one of the indicators of positivism psychology which is defined with characteristics such as the person believing in his/her abilities to achieve success, being diligent in pursuing goals, creating positive perceptions about himself/herself and tolerating the problems [12]. Thus, psychological capital consists of self-perception, having a plan to achieve success and tolerance against problems [13]. Psychological capital is a complex and congruent structure that includes four perceptual-cognitive components that are hope, self-efficiency, resiliency and optimism [14]. These components give meaning to the life of the person, stabilise the person's efforts to change the stressing situations and prepare him/her to enter the action through a cooperative and evaluative process [15], [16], [17]. It is believed that there is a relationship between each of psychological capital components and physical diseases [17], [18].

The relatively high prevalence of IBS and high co-occurrence of this disorder with psychological problems have encouraged the researchers to evaluate the effectiveness of various psychological therapies on this disorder. Acceptance and commitment therapy (ACT) is one of the newfound psychological therapies in Iran which has become very beneficial recently. This context-based therapy, emphasises on building a valuable and meaningful life instead of reducing and omitting symptoms such as annoying thoughts and emotions. About one decade ago, Hayes introduced the third generation of behavioural therapies as a representative of the therapies formed in last 20 years and emphasised on the role of acceptance and conscious attention for making a change [2], [18].

Acceptance denotes to the active inclination to experience emotions, physical senses and thoughts without trying to control or change them [19]. In ACT, the main intention is to form psychological flexibility [17]; that is creating the ability to choose an action which is more appropriate among various options. The flexibility formed by acceptance and mindfulness helps the patient to react less to his/her physical senses [18]. The final goal of ACT is to help the person gain a purposive sense of life, in a way that includes his/her life values, and then working towards

those values [20]. Different researches have studied the ACT in different conditions. Wetherell et Al. evaluate the efficacy of ACT and behavioural-cognitive therapy in patients with chronic pain. The findings showed that pain, depression and pain induced anxiety had been reduced significantly in ACT group [19]. Nowadays, ACT is known as an effective therapy for depression and anxiety which are both common in IBS patients. Also, it has been previously shown that ACT has a positive effect on quality of life and mental state of cancer patients [8].

Hence, with regards to the high co-occurrence of IBS with psychological problems such as depression, and the probable effect of ACT matrix on this group of patients, and lack of published study to assess the efficacy of this therapy on IBS patients in Iran, the current study aims to evaluate the efficacy of ACT matrix on depression and psychological capital of the patients with IBS.

## Material and Methods

This study was performed using the quasi-experimental method and pretest-posttest design with the control group. Intervention group underwent ACT matrix. The statistical population of this study consisted of all of male and female IBS patients who were introduced to the researcher in three clinics in Tehran by gastroenterology specialist, from October 2016 to March 2017. Using convenience sampling, among 57 patients who were introduced to the researcher, 40 met the inclusion criteria. These patients were randomly assigned to intervention and control groups. The inclusion criteria were a definite diagnosis of IBS by a gastroenterologist, having the minimum literacy for reading and writing to fill the questionnaires and inclination of the person to take part in the study. The exclusion criteria included the history of attending ACT-related courses and also more than 2 session's absence in the held courses. The data were collected using the short-form of Beck Depression Questionnaire and Psychological Capital Questionnaire (PCQ), which were completed by the patients. The intervention group, underwent the ACT, in addition to the common pharmacotherapy; but the control group did not receive this therapy and only underwent the common pharmacotherapies. Both groups have received and completed the related questionnaires before the therapy (pretest).

Beck Depression Inventory (BDI) short form: This questionnaire has 13 self-report propositions that express specific symptoms of depression. Each proposition of this questionnaire consists of a four-optioned scale, the domain of which is sorted from 0 to 3. Maximum and minimum of its scores are respectively 39 and 0. This questionnaire has been developed to measure different typology of depression

(emotional, cognitive, motivational and physiological). Cronbach's alpha and split-half coefficients were 0.89 and 0.82 respectively for the whole questionnaire [22]. Psychological Capital Questionnaire (PCQ) of Lothans has 24 items which consist of 4 components: hope, tolerance, optimism and self-efficiency [23]. The items of the questionnaire are in the form of six-point Likert scale (completely disagree to agree completely). To get the psychological capital score, first the score of each component was calculated, and the sum of the scores of these components was considered as the total score of psychological capital. The reliability of this Questionnaire was previously evaluated and confirmed by Cronbach's alpha 0.85 [24].

The ACT matrix package consists of 6 principles (cognitive defusion, acceptance, being present, observing self, values clarification and committed action) which were presented to the IBS patients during six 90 minutes' sessions. In the first session, the psychological flexibility viewpoint was introduced by drawing a matrix. This matrix consisted of 2 intersecting vertical and horizontal lines which form a four-room. At the top of the vertical line, realities are put, which are sensible through five senses. At the bottom of the vertical line, the mental experiences are put. These mental experiences can be the person's negative experiences and worries which are written at the left bottom section of the matrix. But in the other section which is the right bottom, the values (important things or people) of the person are put. In the first stage, it is necessary for the person to understand the difference between reality and mental experience and distinguish them from each other (cognitive defusion). The second difference which a person should pay attention to is his/her behaviors, so that he/she can determine if his/her behaviour is in regards to getting away from the worries or approaching the values. Paying attention to these two differences leads to awareness, and awareness prepares the ground for a change. The second session is focusing on finding awareness on the efficacy of thoughts and behaviours. In a way that to what extent the set of thoughts, feelings, physical senses and behaviour in last week's practices have reduced the person's worries and led him/her towards the values. Usually, people are stuck and in a false cycle of negative mentality along with worry, and eventually are unable to move towards the values. In the third session, the attention-stealing hooks that concern the person's mind were explained, and the patients learnt to get free of their continual mental-harassment. In the fourth session, the verbal Aikido was practised with the patients. Aikido is an oriental martial art which uses the opponent's force to overcome him/her, without any serious harm done to them. This technique is, in fact, a kind of peace and friendship, without anyone getting hurt. This method is useful for facing worries, without avoidance or fighting. In the fifth session, self-compassion was taught, so that the person can have compassion on and respect himself/herself. In the sixth session, the viewpoint

selection force inhibition was taught, so that it would lead to preventing mental conflicts in the future. At the end of each session, some homework was given, and they were evaluated and investigated at the beginning of the next session [27]. After the end of the intervention, both groups completed the related questionnaires (posttest).

## Results

The results of the Shapiro-Wilk Test, which was used to assess the normality of the distribution of each variable, clearly indicates the normality of data. In this study, the sample consisted of 30 IBS patients, which 19 of them were females (63.3%) and 11 of them were males (36.7%). The participants' age ranged from 19 to 60 years old, and the mean of their ages was 31.93. Seventeen of these patients were single, 10 were married, and 3 have lost/divorced their spouses.

**Table 1: Gastrointestinal symptoms in the two studied groups**

| Symptom      |           | Groups       |         | Total |
|--------------|-----------|--------------|---------|-------|
|              |           | Experimental | Control |       |
| Diarrhoea    | Frequency | 5            | 4       | 9     |
|              | Percent   | 16.7         | 13.3    | 30    |
| Constipation | Frequency | 4            | 5       | 9     |
|              | Percent   | 13.3         | 16.7    | 30    |
| Both         | Frequency | 6            | 6       | 12    |
|              | Percent   | 20           | 20      | 40    |
| Total        | Frequency | 15           | 15      | 30    |
|              | Percent   | 50           | 50      | 100   |

There was not a significant statistical difference between the two studied groups from the aspect of age, gender and marital status ( $P > 0.05$ ). From the aspect of suffering diarrhoea or constipation or both of these conditions, there was not a significant statistical difference between the two groups of patients ( $p > 0.05$ ) (Table 1).

**Table 2: Depression raw scores in two studied groups**

| Variables                    |                    | Groups       |         |
|------------------------------|--------------------|--------------|---------|
|                              |                    | Experimental | Control |
| Depression scores (pretest)  | Mean               | 28.93        | 27.86   |
|                              | Standard Deviation | 7.86         | 8.62    |
| Depression scores (posttest) | Mean               | 4.46         | 31.53   |
|                              | Standard Deviation | 3.20         | 4.82    |

The mean and standard deviation of raw scores of depression and psychological capital is presented in Tables 2 and 3.

**Table 3: Psychological capital in the two studied groups**

| Variables                             | Experimental Group Control Group |                    |       |                    |
|---------------------------------------|----------------------------------|--------------------|-------|--------------------|
|                                       | Mean                             | Standard Deviation | Mean  | Standard Deviation |
| Psychological capital pretest scores  | 32.86                            | 8.08               | 10.26 | 14.34              |
| Psychological capital posttest scores | 104.20                           | 12.10              | 38.13 | 13.27              |

Data analysis showed that there is a significant difference between the modified mean of

depression and psychological capital scores in the control and experimental groups in the posttest stage. This means that ACT matrix based on acceptance and commitment is effective on depression and psychological capital of the patients suffering IBS. As is observed in table 4, the group effect is significant for psychological capital and depression scores ( $\eta^2 = 0.959$  and  $p < 0.0001$ ).

**Table 4: Results of multivariate analysis of covariance (MANCOVA)**

| Change resources      | Wilks Lambda | F-statistic | The degree of freedom 1 | The degree of freedom 2 | Significance | $\eta^2$ |
|-----------------------|--------------|-------------|-------------------------|-------------------------|--------------|----------|
| Psychological capital | 0.70         | 2.20        | 4                       | 21                      | 0.10         | 0.29     |
| Depression            | 0.91         | 0.50        | 4                       | 21                      | 0.73         | 0.08     |
| Group                 | 0.04         | 123.18      | 4                       | 21                      | < 0.0001     | 0.95     |

This significance confirms that significant general changes have happened in psychological capital and depression scores. It is observed in covariance's part that pretests of none of the variables had any effect on posttest score.

**Table 5: Results of analysis of covariance (ANCOVA) in MANCOVA**

| Component             | Change resources | Sum of squares | Degree of freedom | Mean of squares | F-statistics | significance | $\eta^2$ |
|-----------------------|------------------|----------------|-------------------|-----------------|--------------|--------------|----------|
| Depression            | Group            | 4392.51        | 1                 | 4392.48         | 2.34         | < 0.0001     | 0.91     |
|                       | Error            | 419.44         | 24                | 17.48           | 51           |              |          |
| Psychological capital | Group            | 2785.22        | 1                 | 2785.24         | 2.19         | < 0.0001     | 0.90     |
|                       | Error            | 277.54         | 24                | 115.48          | 41           |              |          |

The effect size is calculated to be 0.959 for change resources which is a strong amount and shows the effects of therapy (Table 5).

**Table 6: Modified means and paired comparison of the mean of depression scores**

| Experimental group | Control group | Mean difference | Standard deviation | significance |
|--------------------|---------------|-----------------|--------------------|--------------|
| 4.195              | 31.80         | -27.61          | 1.742              | < 0.0001     |

Data analysis using follow-up test showed that treatment based on acceptance and commitment has had a significant positive effect on depression and psychological capital in IBS patients and have caused them to heal (Tables 6 and 7).

**Table 7: Modified means and paired comparison of the mean of psychological scores (Toki's follow-up)**

| Experimental group | Control group | Mean difference | Standard deviation | Significance |
|--------------------|---------------|-----------------|--------------------|--------------|
| 105.92             | 36.40         | 69.52           | 4.47               | < 0.0001     |

## Discussion

The research background shows that the obtained results in this study are consistent with results of Mohammadi et al., [24], Baghban et al., [28],

Blanchard et al., [1], Lotsson et al., [29] and Gillanders et al., [30]. Depression is one of the psychological factors which is characterised by a loss of sense of control over emotion and behaviour, and the person suffers a lot [31]. These changes almost always cause the experience of negative feelings, disruption of interpersonal, social and occupational functions of the patient and are followed by continual physiological stimulation of the nervous system [32]. The bowel nervous system is very sensitive to the changes mental status, in a way that negative emotions can cause changes in movement activities of the bowel and create bowel symptoms such as symptoms occur in IBS [33]. To explain the effectiveness of the matrix of ACT on the reduction of depression in IBS patients, several possibilities can be considered. ACT can target the avoidance pattern. During the interventions, reduction of the experimental avoidances are considered as a mediator of change in the symptoms of depression [7]. Avoidance is defined as an effort to escape depressing thoughts and memories, which are brought to the depressed person's awareness [20]. In this treatment, the accepted practices and discussions about values and goals of the person cause reduction of depression in IBS patients. This treatment teaches people how to let go of their avoidance beliefs and accept them instead of trying to control them [17]. Even though experimental avoidances have reducing effects on the unpleasant experience in short-term, but have many destructive effects in long-term and can lead to psychological inflexibility and functional deficiency. In this treatment, persons are encouraged to evaluate their behaviour based on the success of the strategies they use. Successful strategies are usually the ones that help people act based on their values. Creating flexibility through a focus on field related to thoughts and emotions leads to desirable behaviours and also leads to a reduction of credibility in the depressed [34].

Additionally, one of the reasons for depression is the negative cognitions related to one's abilities [31]. In the ACT, participants are guided towards this direction so that they see themselves detached from their thoughts and emotions. This, in turn, causes a reformation in negative cognitions [32].

In ACT, increasing of psychological flexibility is the mediator for healing the psychological problems such as depression. The depressed patients are usually looking to bring reasons for their depression, which leads to increasing of rumination, and they criticise their experience negatively [33]. In ACT, the change and relationship reformation of the person with his/her feelings are strengthened through mental awareness practices, self-regard and awareness of body conditions. In this regard, efforts are made to increase acceptance of thoughts, beliefs, emotions and sentimental, physical perceptions [8]. Thus, the patients with IBS observe their depressing thoughts and detach themselves from the ruminations caused by depression. Hence, the content of thoughts is

experienced regardless of threatening aspects and ruminations that are being experienced currently. Also, the acceptance component in ACT makes the IBS patients able to accept their unpleasant internal experiences, and this causes the experiences to seem less threatening, and the symptoms are alleviated in the person. On the other hand, there is the psychological capital which can be explained in this way; it has newly found its place in Iranian researches and has been considered by the researchers of health psychology. Psychological capital consists of 4 components: self-efficacy, hope, tolerance and optimism. Regarding self-efficacy component, Masuda et al., [34] evaluate the effect of cognitive defusion on self-directed negative thoughts, which an example of these thoughts are the thoughts related to self-efficacy.

The results showed a significant reduction in the amount of these thoughts by using cognitive-defusion techniques. It is probable that self-knowledge based on the values and rebuilding them has been effective on reducing the negative self-directed thoughts. As Dikemente claims, persons who are less sure of their abilities in doing behaviours such as compatibility with new situations, sense of efficacy, usefulness, etc., may get stuck in pre-contemplation or unawareness stage and feel desperate about the probability of change. For the frustrated person to reach the stage of decision and preparation to stage of action and maintenance from the current stage, the sense of self-efficacy and self-confidence should be strengthened in him/her. One of the important stages in most treatments, especially ACT, is assigned to the taking responsibly of treatment by the participants [35]. Self-efficacy is in a way the answer to this question that "Will I be able to do this action or not?" The ACT can increase the self-efficacy in person by assigning suitable homework and working on the values. The ACT can be effective on increasing of self-efficacy and taking the responsibility of treatment by the participants through emphasising on flexibility, clarification of values, and discussion on the matter that change is possible and also doing various practices successfully.

Thus, in this study, it seems that ACT matrix helped the IBS patients to reflect their past experiences happily and gain mental stability. Hope is another component of psychological capital. Hope is a cognitive process but has emotional consequences. Thus, hope is not a passive emotion that appears in only dark moments of life; but is a cognitive process which people actively try to reach their goals through it. Hence, hope is a process through which the person determines his/her goals, makes approaches to reach them and creates and maintains the necessary motivation to perform these approaches [36].

It should be considered that patients who are hopeful towards healing and health, get treated faster due to positive beliefs because it causes positive physiological changes to take place in the human.

ACT causes the person to find his/her life rich, meaningful and significant, which leads to enhancement of daily functions, mental and psychological health. Thus, ACT matrix can increase the hope in IBS patients.

Another component of psychological capital is tolerance. The tolerant people have a different viewpoint towards stressing condition, do not surrender to it and do not become passive, but they fight against the conditions and confront it, they do not avoid it [37]. This necessitates an effort to know the environmental conditions, and ACT helps people to give their entire attention to the existing conditions without judging through increasing mental awareness; because some of the factors that affect the mental health of IBS patients negatively are emotions like guilt, deficiency and frustration [38]. Using ACT can increase efficacy and tolerance as well as reducing mental symptoms, because of some hidden mechanism existing in it such as acceptance, an increase of awareness, sensitivity elimination, being present and observation without judging. The therapists, instead of focusing on changing the content of the patient's problem, help the participants in accepting and having the inclination to experiencing thoughts and emotions and emphasise on reforming the attention and awareness of the referee by using mental awareness techniques. This approach is a behavioural therapy which used the skills of mental awareness, acceptance and defusion-knowing to increase psychological flexibility. ACT caused the increasing of the referee's ability to form a relationship with their experiment at present and based on what is possible for them at present, and this leads to increase of tolerance in IBS patients. In the end, the optimism component is introduced. ACT can give the persons the ability to pay attention to the current experiences optimistically, through having freedom in their choices and the responsibility they accept to do a job. Pessimism causes the person to experience negative feeling and emotions. On the opposite, is pessimism that expands the positive feelings and emotions. To explain the results of this study, it can point out that ACT matrix teaches people that we all are suffering in life. All of our thoughts, emotions, physical signs, urges and memories are clean sufferings, but if we value them too much and highlight them, they create unclean sufferings which are unpleasant for us. Thus, by defusing and not doing cognitive mix-ups, one can live happily and be optimistic.

Optimism is not the superficial positivity, but the optimists are problem solvers and plan for their activities, and then act according to them [39]. Hence, it can be said that optimistic people act more successfully in solving their problems and in their marriage, and do not take a passive position towards the problems and have a more positive viewpoint towards others [40], [41].

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