Research Article

The Effectiveness of Cognitive-Based Mindfulness Therapy on Cognitive Flexibility and Psychological Capital of Adolescents

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Abstract:

Background: Mindfulness is the third wave of cognitive-behavioral therapy (CBT) approach proposed in recent years to promote a different relationship or attitude with thoughts, feelings, and emotions. This study aimed to investigate the effect of mindfulness-based cognitive group therapy on the cognitive flexibility and psychological capital of adolescents.

Methods: Accordingly, a pretest-posttest quasi-experimental study with a control group was conducted in which a sample of 30 high school male students with the lowest scores in the Psychological Flexibility and Psychological Capital Questionnaires were included and randomly assigned into two groups of experimental and control groups. Mindfulness-based cognitive therapy was performed for the experimental group during 8 seasons of 90 minutes, one season per week. No intervention was performed in the control group. After the completion of sessions, a posttest was performed on experimental and control groups.

Results: The results of covariance analysis showed a significant difference in the mean posttest scores between experimental and control groups; the level of cognitive flexibility and psychological capital components was significantly increased in individuals under intervention.

Conclusion: Mindfulness-based cognitive therapy seems to increase cognitive flexibility and psychological capital in adolescents.

Keywords: Mindfulness, Cognitive Flexibility, Psychological Capital, adolescents

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Background:

Positive psychology, which focuses on healthy aspects of the human rather than focusing on the ills, has recently attracted the attention of many researchers (1). Psychological capital is a conceptual structure of positive psychology characterized by: believing in your abilities to achieve success (self-efficacy), perseverance in pursuing goals (hope), flexibility, responsibility, and perseverance in dealing with difficulties, problems, and even positive life events (resilience), and making a positive attribution about yourself and the world around (optimism) (2). Those who are positivist and optimistic about the future believe that they can control important events in their lives and work harder because they expect a positive return on their work and when faced with an obstacle, they use different solutions until they succeed (3). Through an interactive and evaluative process, these components give meaning to the life of an individual, keep his/her effort to change stressful situations, prepare him/her into taking action, and guarantee his/her flexibility, resistance, and tenacity in achieving goals (4).

The concept of cognitive flexibility has received special attention with the advent of the cognitive approach. Some researchers have defined cognitive flexibility as the degree to which an individual appraises the controllability in different situations (5). The ability to change cognitive sets to adapt to changing environmental stimuli is a key factor in the definitions of cognitive flexibility (6).

In recent years, cognitive inflexibility has been introduced by the model of acceptance and commitment therapy instead of experiential avoidance (7). It is a negative strategy or tendency to respond aiming at reducing or eliminating an unpleasant feeling and the resultant thoughts through an escape process (8). Research findings have shown that there is a positive association between cognitive inflexibility and a wide range of psychological problems (depression, anxiety, panic disorder, blood phobia, trichotillomania, job stress, substance abuse, and worriedness (9).

Mindfulness is a concept with an origin in Buddhism that has attracted the attention of psychologists, psychotherapists, and researchers in recent years. Mindfulness is defined as the state of aroused attention and awareness of what is taking place in the present moment (10). Such awareness is purposeful with nonjudgmental acceptance of the experiences taking place in the present moment (11). Mindfulness does not seek to change the content of thoughts, but to create a different relationship or attitude toward thoughts, feelings, and emotions, including maintaining full and moment-to-moment awareness and having an attitude of accepting without judgment (12).

Mindfulness is a method of living better, relieving pain, and making life more rich and meaningful (13). Evidence of research

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literature shows the positive effects of mindfulness training on health (14), and increase psychological resilience (15). On the other hand, mindfulness meditation activates an area in the brain that is responsible for positive emotions and causes beneficial effects on the body's immune function (16). This process allows us to receive events less than they are distressed at the moment.

Many studies have shown that mindfulness in daily life is positively associated with mental health and well-being achievements such as life satisfaction, self-confidence and optimism (17), psychological flexibility (18), and is negatively associated with rumination and mental disorders such as anxiety. Mindful people have more ability to recognize, manage, and solve everyday problems and have greater self-compassion, optimism, and cognitive flexibility (19).

Flook and Goldberg et al. (2013) conducted a study entitled "mindfulness for teachers: a pilot study to assess effects on stress, burnout and teaching efficacy" (20). The results of this study showed a positive and significant relationship between teachers' mindfulness and self-efficacy and a significant negative relationship between teachers' mindfulness and stress and burnout. Also, in a study by Morgan and Ransford et al. (2013) on patients with knee osteoarthritis, it was shown that patients with higher levels of mindfulness were found with lower levels of depression and stress and higher levels of self-efficacy and quality of life (21). Samouei and Ghasemi (2015) conducted a study on Isfahan medical students and reported that mindfulness training has a positive effect on the components of psychological capital (22). Heydarian, Zahrakar, and Mohsenzadeh (2016) found in their study that mindfulness is associated with increased resilience and reduced rumination in women with cancer (23). The study of Shojaeyan and Abolmaali (2016) also showed that mindfulness training was associated with an increase in the components of psychological capital components in veterans (24). Consistent with this finding, Waleed Pak, Khalidi, and Moeni Manesh (2013) found that mindfulness training increased the optimism of pregnant women with diabetes (25). In addition, in a study on mothers with mentally retarded children, Khaleghi and Zargar (2013) showed that mindfulness training increased life expectancy and reduced depression of these mothers (26).

Although many studies have investigated the effectiveness of mindfulness on positive and negative psychological characteristics, there is no study on the effect of mindfulness on cognitive flexibility and psychological capital of adolescents, especially in our country. Hence, further studies seem necessary in this regard. Accordingly, the main purpose of this study was to investigate the effectiveness of mindfulness-based cognitive therapy on cognitive flexibility and psychological capital of the adolescent student population.

Methods

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The present research had a quasi-experimental design. In this study, a pretest-posttest control group design was used in which high school students were selected and assigned to experimental and control groups. The sample was randomly selected from 3 boys' high schools in Mahmoud Abad(Iran). First, the psychological flexibility and psychological capital questionnaire were delivered to 250 students, among whom 30 students with the lowest scores on the scale were selected as the main sample, of whom 15 students were randomly placed in the experimental group and the other 15 students in the control group. After selecting the final groups, a briefing session was established to explain the objectives of the research and motivate the students to participate in the research. After the completion of consent forms, the researchers assured the participants that all the material presented in the treatment sessions and the results of the questionnaires would be confidential (See Table 1). The experimental group then received eight 90-minute sessions of mindfulness therapy.

Psychological capital questionnaire: This questionnaire was first introduced by Luthans and Avolio (2007) (27) to measure psychological capital. This scale has 24 items that measure the four subscales of self-efficacy, hope, resilience, and optimism. It is scored as a Likert scale (1-6), in which only items 13, 20, and 23 are reversely scored. Luthans and Avolio (2007) (27) reported a comparative fitness of 0.97 and a root mean square error of approximately 0.08 for this model. Shojaeyan and Abolmaali (2016) (24) confirmed the internal consistency of the questionnaire through a Cronbach's alpha of 0.82. In the present study, a Cronbach's alpha coefficient of 0.79 was calculated for the internal consistency of the whole questionnaire.

Cognitive flexibility questionnaire: This questionnaire includes 12 items which are scored as a Likert scale (1-5). It was first introduced by Martin and Rubin (1995) (28) and consists of three components including communication, flexibility, and rigidity of attitudes regarding personal habits. This scale assesses a person's awareness that (a) there are alternatives and options in any given situation, (b) there is a willingness to be flexible and adaptable to the situation, and (c) there is self-efficacy in flexibility. The validity of this scale was reported with a Cronbach's alpha of 0.80 (28). In this study, Cronbach's alpha of the internal consistency of the questionnaire was calculated as 0.78.

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Table 1. Summary of mindfulness-based cognitive therapy sessions

Session 1 Automated guidance: communication, goal-setting, brief mindfulness introduction session, general policy setting, eating raisin focusing on 3-minute breathing space and discussing it, reviewing exercise, finishing session focusing on 3-minute breathing space, homework exercises
Session 2 Facing obstacles: homework review, body checking practice, providing feedback, focusing on thoughts and emotions and recognizing disturbing thoughts, breathing with mindfulness, recording events (pleasant and unpleasant events every day), homework exercises
Session 3 Breathing with mindfulness: homework review, meditation practice in sitting position, review of practice, 3-minute breathing space practice, homework exercises
Session 4 Staying in the moment: homework review, seeing and listening meditation training, 5-minute seeing and listening practice, seeing and listening meditation homework, 30-minute meditation in sitting position, awareness of breathing, body sounds, thoughts, paying attention to how we communicate our experiences through reactions to our thoughts, feelings, or physical sensations, exercise review
Session 5 Acceptance/authorization of presence: homework review, practice 3-minute breathing space, sitting meditation (awareness of breathing, body, sounds, thoughts), awareness of pleasant and unpleasant events on feelings, thoughts, and body sensations, homework exercise
Session 6 Thoughts do not have a real origin: homework review, conscious yoga, talk about looking at thoughts differently or alternate thoughts, sitting meditation (awareness of sounds and thoughts), homework exercise
Session 7 Care of yourself in the best way: homework review, the practice of observing the connection between activity and mood, making a list of enjoyable activities, planning and preparing a suitable program for such activities, minute breathing space, homework exercise
Session 8 Acceptance and change: homework review, practicing awareness of breathing, body sounds, and thoughts, and overviewing the programs, finding positive reasons to continue practicing, running a posttest

Results

Table 2 shows the descriptive components of the variables studied in the experimental and control groups during pretest and posttest. Due to the number of dependent variables and the quasi-experimental method used in the study, multivariate covariance was used to analyze the data. Before testing the hypotheses, the hypotheses of analysis of covariance were examined. Because the sample size of both experimental and control groups was less than 50, therefore, according to the recommendation of Tabachnick and Fidell, the Shapiro-Wilk test was used to examine the normal distribution of pretest variables in the experimental and control groups.

Levene's test was used to examine the equality of error variance of posttest variables between the experimental and control groups and the results showed that the assumptions of using

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Table 2. The mean and standard deviation of research variables in the pretest and posttest stages

Groups	Test	Variables					
		Statistical index	Cognitive flexibility	Self-efficacy	Resilience	Hope	Optimism
Experimental group	Pretest	M	31.80	20.06	20.13	18.20	18.80
		SD	2.81	3.57	3.31	2.14	3.48
	Posttest	M	34.40	23.33	22.53	21.06	21.93
		SD	3.64	4.450	3.81	2.78	4.04
Control group	Pretest	M	32.03	21.66	19.46	19.60	18.66
		SD	3.25	3.47	3.75	2.40	3.39
	Posttest	M	31.93	20.60	19.66	18.63	18.93
		SD	3.12	3.29	3.94	1.66	2.53

analysis of covariance between posttest data were valid. Moreover, the results of multivariate analysis of covariance showed that the linear composition of the dependent variables was significantly different between the experimental and control groups. Therefore, the results of a one-way analysis of covariance were evaluated to determine the effect of the independent variables on each level of dependent variables separately. Table 3 shows the results of a one-way analysis of covariance in comparing the variables between the experimental and control groups.

Discussion

This study aimed to investigate the effect of mindfulness on the cognitive flexibility and psychological capital of adolescents.

Based on the results, it can be said that mindfulness training was effective in increasing flexibility and psychological capital components.

Table 3. Univariate analysis of covariance in experimental and control groups

Dependent variable	MS	df	F	sig	η^2
Cognitive flexibility	38.992	1	16.512	0.001	0.418
Self-efficacy	80.800	1	23.520	0.001	0.506
Resilience	37.255	1	7.973	0.001	0.468
Hope	38.654	1	29.255	0.01	0.257
Optimism	50.499	1	16.353	0.001	0.416

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The findings showed that mindfulness training increased the level of cognitive flexibility, which is consistent with the results of Hatam Khani (2011) (18) and Silberstein et al. (2012) (15). Psychological flexibility refers to the ability of individuals to focus on the present situation and use the opportunities afforded by that situation to take action toward achieving goals and values despite challenging or unwanted psychological events (for example; thoughts, feelings, mental images, and memories) (29). On the other hand, mindfulness can be perceived in the form of two processes of sensitization and desensitization. Mindfulness desensitizes individuals regarding negative emotionally distressing aspects by reducing empirical avoidance (cognitive inflexibility) and sensitizes individuals by focusing on the relationship between emotional states and experiencing automated reactions. The sensitization and desensitization nature of mindfulness leads to psychological flexibility and allows individuals to enhance their emotional and behavioral responses and coping skills, and lets negative emotions and attitudes leave the mind (30). Mindfulness also allows people to relate to their thoughts and feelings in a different way, to believe that their emotions are normal, to control and share their emotions (15). Hence, such a different way of dealing with thoughts and feelings causes an increase in psychological flexibility.

On the other hand, because psychological damage roots in habitual thoughts, rumination, dysfunctional beliefs, and cognitive inflexibility, thus, mindfulness transforms thoughts and behaviors that were previously unconscious or habitual into observable phenomena that occur in the individual's body or mind. As a result, increasing mindfulness and emotion regulation ability resulting from these exercises lead to a reduction in psychological inflexibility. In other words, mindfulness brings clarity to experiences and teaches people to experience their life at the moment, which reduces negative psychological symptoms and cognitive inflexibility (31).

Another finding of this study was that mindfulness exercises have a positive effect on the components of psychological capital (i.e., self-efficacy, hope, resilience, and optimism) with is consistent with the findings of Samouei and Ghasemi (2015) (22), Shojaeyan and Abolmaali (2016) (24), Heydarian et al. (2015) (23) and Waleed Pak et al. (2013) (25), and can be explained in terms of the following probabilities.

According to Bandura (1997) (32), self-efficacy is defined as an individual's firm belief in his/her abilities to mobilize cognitive resources and the pathways needed to successfully perform a specific task within a given area. On the other hand, people without mindfulness skills negatively judge themselves and try to avoid negative thoughts and feelings without flexibility and, in the long run, most of these efforts lead to psychological

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helplessness, resulting in disability and low perceived self-efficacy.

Mindfulness provides people with the ability to look differently at events and to increase self-control by avoiding negative self-judgment and dealing effectively with problems. In this regard, Nicholas (2007) (33) stated that self-efficacy beliefs are associated with patients' acceptance of pain and readiness for change. Pain acceptance, which is actually through a process of stopping fighting pain and learning how to live with it, can lead to favorable results and positively affect the individual's perceived self-efficacy by increasing the level of tolerance.

According to Seligman (2006) (34), optimism is an explanatory style in which a person attributes positive events to personal, permanent, and pervasive causes, and negative events to external, temporary, and specific factors. On one hand, learning of different ways of dealing with emotions and distress is one of the mechanisms of mindfulness (35). It is harmful and ineffective to focus on some emotions while positive expectations about outcomes and events increase optimism. On the other hand, mindfulness meditation activates the brain region that is associated with positive expectations and emotions (16).

The findings also showed that mindfulness training increased hope. Mindfulness requires special cognitive, behavioral, and metacognitive strategies to concentrate the process of attention, which in turn prevents a downward spiral of negative mood, negative thinking, and tendency to worrying responses, and the growth of new views and the appearance of pleasant thoughts and emotions. This view can reinforce hope in individuals and, instead of involuntary and thoughtless reactions, cause them to focus on their roles and priority and individual will in solving problems, to think of different ways to achieve their goals, and to enrich and give meaning to their lives (24). Many researchers have also concluded that mindfulness is more effective in creating a feeling of calm, hope, ability to face stress, self-confidence, and inner control (36). Mindfulness can help people to avoid automated thoughts, habits, and unhealthy behavioral patterns, and therefore can play an important role in behavioral regulation and increase hope (26).

Another finding of the present study was the positive effect of mindfulness on resilience. Resilient people look at traumatic events as both threatening and challenging opportunities (27). Accordingly, it seems that mindfulness training causes the individual to consciously and purposefully enhance the capacity and capability of the controlled information processing system and change his/her assessment of the surrounding affairs (24).

Due to its emphasis on controlled attention and prevention of automated processing, it can therefore be said that mindfulness training allows people to directly face their emotions without bias and negative judgment, instead of

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activating the negative processing cycle and empirical avoidance (37). In addition, mindfulness enhances capabilities (36). Mindful people perceive internal and external realities freely and without distortion, and possess a great ability to deal with a wide range of thoughts, emotions, and experiences (both pleasant and unpleasant) (38). Hence, this is a good way to solve problems and enhance capabilities and resilience.

Every research has certain limitations. The main limitations of the present study were the lack of follow-up for treatment results and the study sample that was selected from high school boys, which makes it difficult to generalize the results to all students. Given the effect of mindfulness on the cognitive flexibility and psychological capital of students, it is suggested for policymakers, planners, and executives of the education system to conduct mindfulness workshops for students to improve the process of psychological well-being and improve the quality of education.

Conclusion

Based on obtained results of covariance analysis can conclude that a significant difference in the mean posttest scores between experimental and control groups. Also, the level of cognitive flexibility and psychological capital components was significantly increased in individuals under intervention. In addition**,** mindfulness-based cognitive therapy seems to increase cognitive flexibility and psychological capital in adolescents.

Conflicts of Interest:

There are no conflicts of interest

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