

Original Article

The effectiveness of mindfulness training program on the defense mechanisms of MS patients

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Abstract

Multiple sclerosis is a progressive and degenerative disease of the myelin sheath of nerve cells in the central nervous system. MS patients have much higher levels of psychological disorders than healthy individuals that affect their quality of life. Defense mechanisms are strongly associated with the degree of stress tolerance in stressful situations, on the other hand, the experience of pain plays an important role in the mental health and quality of life of MS patients. The present study aimed at investigating the effectiveness of mindfulness on defense mechanisms in patients with MS. The population of the case group was people with MS in Urmia in 2019 who had medical and neurological records in hospitals. In this experimental study, the sample selected through availability sampling consisted of 40 MS patients who were randomly divided into two groups of experimental and control groups. Defense Mechanisms Questionnaire (DSQ) was used to collect data. The data were analyzed by multivariate analysis of variance. The results showed that the differences between the means of the groups were significant for immature mechanisms ($F = 22.649$), mature mechanisms ($F = 25.99$), and psychiatric mechanisms. Thus, mindfulness training had affected defense mechanisms effectively. It is suggested that implementing the necessary training to MS patients and their family can enhance their mindfulness.

Keywords

Mindfulness, defense mechanisms, MS patients.

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Introduction

Multiple sclerosis (MS) is the most common immune disorder affecting the central nervous system (Berer & Krish Namurti, 2014) and is an inflammatory disease in which the lining of the nerve cells of the brain and spinal cord is damaged (Compston, 2008; Pegoretti, Baron, Laman, & Eisel, 2018). While the cause of this disease is unknown, its main mechanism is thought to be destruction of the immune system or failure of myelin-producing cells (Nakahara, MAAlso, AAAlso, & Suzuki, 2012). Specific symptoms of the disease include diplopia, blindness in one eye, muscle weakness, and difficulty feeling or coordinating (Piryonesi & Rostampour, 2021). This disease is a progressive and chronic disease that also affects various aspects of psychological and social life (Siao, Beno, Donshir, & Termelet, 2011). It is associated with various psychological and social problems (Saadat, Kalantrif, Kajbaf, & Hosseini Nejad, 2019; Dadashian, Rajabi, & Jafari, 2021; Pakenham & Samiuz, 2013). MS

patients have executive dysfunction (Halper, 2000) and defects in information processing (Fasoli, Trombay, Dignin & Werfali, 2002). The balance of patients with MS is fundamentally problematic. The cognitive domains that are impaired in patients with MS are extensive such as motor functions, perception, language, learning, and executive functions (Julian, 2011). MS is associated with many traumas and mental disorders such as depression, anxiety, obsessive-compulsive disorder, physical disorders, hostility, phobia, paranoia, psychosis, and loss of well-being (Saadat & et al, 2019; Dennison, Maris & Chalder, 2009; Mitchell, Benita Jovin, Gonzalez & Navarro, 2005). This disorder leads to an increase in self-injurious behaviors such as suicidal ideation and suicide attempts (Dadashian et al, 2021; Pakenham & Samiews, 2013).

Chronic diseases and disorders such as MS lead to self-harm challenges that affect people emotionally, cognitively, and physiologically. Therefore, to protect themselves from challenging, threatening situations and experiences, defense mechanisms are activated which

have the task of protecting in order to enable the person to face with the crises such as MS (Abdulkhodai, Shahidi, Mazaheri, Panaghi, Nejati, 2018; Besharat, 2013; Pakenham & Samius, 2013; Farran, Amara & Davish, 2016) and reduce the harmful effects of stressors with adaptive strategies (Yavari, 2010). Defense mechanisms play an important role in the adaptation of adults who can derive benefit from psychological interventions (Malone, Cohen, Liu, Vaillant & Waldinger, 2013; Asgharkhah, & Shareh, 2017).

In psychoanalytic theory, defense mechanisms are the ways and means by which anxiety is repelled and impulsive and instinctive behavior are controlled (Siraj Khorami, Karami, & Momeni, 2014). The defense mechanism enables individuals to eliminate or reduce stressful stimuli (Basaknejad, Rahimi, Zargar & Majdi Nasab, 2013; American Psychological Association, 2013). Defense mechanisms are strongly related to the degree of stress tolerance and the type of adaptation that each person chooses in stressful situations (Hyphantis, Gallia, Carvalho, 2013; Eimecke, Reims Chimid & Mojdad, 2011). In particular, the type of the stressful experience and discomfort in each person can be related to the adopted coping strategies in the face of life challenges (Stepanchuka, Zuhairkawa & Yakulova, 2013). According to the psychoanalytic approach, people use certain defense styles in the face of stress, which is divided into four groups based on the degree of maturity: immature (immature), psychotic, narcissistic, and mature (grown). Each of these styles includes specific defense mechanisms. It has been found that in people with various diseases, the defense style is underdeveloped and non-adaptive, while in the non-clinical population the defense style is much more developed (Cramer, 2000). The findings of Garrett et al. (Goretti, Particio, Zipoli, Hakiki, Syracuse & et al, 2010) on MS patients showed that these patients used less problem-oriented coping strategies and more emotion-oriented coping strategies and avoidance. Abdulkhodai & et al. (2017) have represented that patients with MS are more inclined to use uncompromising and avoidant mechanisms. In the same line of research, Afzali, Fathi Ashtiani & Azad Fallah (2008) revealed that defense mechanisms are one of the important components in chronic and stressful diseases such as MS that can be used in therapeutic interventions.

Therapeutic measures can increase the use of non-morbid defenses as well as decrease morbid and uncompromising defenses (Bond & Perry, 2004). Pharmacotherapy has led to increasing attempts to find alternative and complementary therapies (Olsen, 2009; Huntley, 2006). Although there is no definitive known cure for MS, several treatments have been helpful. The main goals of these treatments are to restore function after an attack, prevent new attacks, and prevent disability. Initiation of medications is generally recommended for individuals after the first attack when more than two lesions are seen on MRI (Rae-Grant,

Day, Marrie, Rabinstein, Cree & Gronseth, 2018). One of the employed treatments to deal with such psychiatric conditions for MS patients is mindfulness-based treatment (Emel, Baldwin, Bonsk & McCowan, 2008; Crane, 2009; Simpsonson, Booth, Lawrence, Byrne, Mair & Mercer, 2014) which is a protocol-based training program in accordance with mindfulness-based stress reduction and cognitive therapy (Seagal, Williams & Tisdal, 2013). Mindfulness is a form of meditation rooted in Eastern teachings and rituals (Ost, 2008). Also, it is the practice of non-judgmental awareness in the present moment and non-reactive, non-judgmental, and open-hearted observation (Kabat and Zayn, 2003; 2015). Furthermore, mindfulness helps the person in dealing with daily activities and automatic action of the mind, becoming aware of the past and future worlds and controlling itself with moment-by-moment awareness of thoughts, feelings, and physical states (Segal, Williams, & Tisdal, 2002). It is primarily designed to facilitate adaptation to medical illness and serves as a self-regulatory approach to stress reduction, emotion management, and health promotion (Brantley, 2005). This program helps MS patients to adapt to the physical and psychological changes caused by the disease (Fernandez, Bamostark, Baraw, & Simoni, 2011). Repetitive and uncontrollable thought patterns in the form of rumination and worry can both cause symptoms of anxiety and depression in the long run (Raes, 2010). Meditation and mindfulness exercises increase self-awareness and self-acceptance in inpatient leads (Baer r, 2003). In SchirSchirra, & Prakash (2015) research, trait mindfulness reduced emotion dysregulation in individuals with MS. In another study conducted by Sarraj Khorrami, Pasha, Hafez, Bakhtiarpour, & Eftekhari, Z. (2018), mindfulness-based cognitive therapy has reduced immature, neurotic defense mechanisms in patients suffering from major depression in the experimental group. Moreover, after the implementation of treatment on experimental group, the use of mature mechanism has been increased. According to the findings of Einy and Narimani (2019), MBT was markedly effective in improving the ego strength and defense mechanisms of people with a borderline personality disorder.

In general, self-harm (Abdulkho, et al., 2018), defects in information processing (Sayao, Bueno, Devonshire & Tremlett, 2011), psychological and social disorders, and problems (Saadat, et al., 2019; Dadashian, et al., 2021; Pakenham & Samiuz, 2013) triggers inefficient defense mechanisms (Abdulkhodai, et al., 2018). While mindfulness-based programs lead to self-acceptance where the individual accepts their flaws and shortcomings. This program reduces the stress of chronic diseases like MS and affects the usage of defense mechanisms (Pakenham, Mawdsley, Brown & Button, 2018). Consequently, the question of the present study has been expressed in the following statement:

What is the effect of mindfulness training on defense mechanisms in patients with MS?

Method

Participants

The design of this study was an extended quasi-experimental design of pre-test, post-test, with follow-up and a control group. The population consisted of MS patients in Urmia in 2019 who had medical and neurological records in hospitals. With regard to sampling method, among the patients with MS, according to the diagnosis of a neurologist and the medical record referred to the MS association, 40 patients who were willing to participate in the study and met the inclusion criteria were selected and the questionnaire of defense mechanisms was completed by them. Selected individuals were randomly divided into two groups of experimental and control groups. The experimental group underwent 8 two-hour sessions of mindfulness training, one session per week, for two months while the control group received no intervention. Finally, both experimental and control groups were tested. Because of this re-intervention research the ethical criteria of the Iranian Psychological and Counseling Organization are considered. After selecting the sample group and randomly replacing them in the experimental and control groups, the experimental group received 8 ninety-minute mindfulness treatment sessions.

Entry and Exit criteria of research

Exit criteria

- 1) Being associated with another disease
- 2) Participating in other treatment sessions simultaneously
- 3) Receiving mindfulness training in previous courses

Entry criteria

- 1) Conscious satisfaction
- 2) Suffering from the MS
- 3) Ability to participate in group intervention sessions
- 4) Not participating in other educational and medical classes at the same time
- 5) Being fully aware and able to cooperate
- 6) Having the necessary physical and mental readiness to answer the questions
- 7) Not receiving other psychological therapies during the research

Instrument

Defense Mechanisms Scale (DSQ-40)

Defense Styles Questionnaire (DSQ-40) (Andrews, Singh & Bond, 1993) was developed based on the initial questionnaire of Bond, Gardner, Christian, & Sigal (1983) that identified and distinguished 20 defense mechanisms in 3 factors: mature, immature and psychologically annoying (Heydari Nasab & Sha'iri,

2011). The scoring scale is in the form of Likert in which the respondent's level of agreement or disagreement on each question was assessed using a 9-point scale. In each defense mechanisms the person gets a score between 2 to 18. If the obtained scores in each case were more than 10, it means that the person uses that mechanism. In general, the average score for each individual is specified in each style and compared with the average score of the person in other styles. A person with the highest average has a defensive style. This questionnaire has been evaluated in countries such as Japan, France, Brazil, Portugal, and Iran. (Bonsac et al., 1998; Disasters and, colleagues, 2004, quoted by Fathi Ashtiani, 2009). The resultant 40-item DSQ was established in order to identify defense styles accurately which is correlated with hypothesized patterns of unconscious psychological mechanisms. The reconstructed DSQ also showed reasonable psychometric properties including internal consistency and appropriate temporal stability in a trait measure. The availability of normative values established on a large sample along with the absence of any bias due to the sex of the respondents as well as a simple scoring procedure contributes effectively to the desirability of the 40-item DSQ (Andrews & et al 1993). The Defense Styles Questionnaire was also reviewed and standardized by Heidari Nasab (2006) in Iran. The standardization steps were generally followed by translating the questionnaire into Persian and eliminating its literary deficiencies in two sections: reliability and validity. According to the findings related to the content validity, concurrent validity, and structural validity, a questionnaire like the original version has a good validity (Heidari Nasab, 2006, quoted by Fathi Ashtiani, 2009).

Procedure

In general, written consent was prepared with the following points in mind: the principle of confidentiality should be observed, the psychological health of the participants should be given priority, and if people do not wish to participate in the intervention process their request should be respected. In order to examine the research questions, the datasets were imported into SPSS statistical software with the aim of Classification and analysis of the obtained data. Following tables illustrates the descriptive indicators of study including mean and standard deviation in pre-test and post-test. Moreover, simultaneous Multivariate analysis of covariance (MANCOVA) and Leven test were used to test the hypothesis.

Mindfulness Training Program

Table 1. Content of mindfulness-based cognitive therapy sessions (Segal et al., 2002)

Session	Content	Homework
First	Pre-test, eating mind-conscious raisins; Physical examination	Perform a physical examination in 6 days
Second	Practice thoughts and feelings	Visualize an ambiguous scenario and then examine their reactions to the event; How it affects mood, recording pleasant events (imagining a pleasant event or moment and observing the thoughts, feelings, and bodily sensations associated with it)
Third	Sitting meditation	Conscious mind walking; Three-minute breathing space three times a day
Fourth	See meditation and hear meditation; duty	Sitting meditation (presence of mind for reactivation, sounds, thoughts and consciousness without special orientation), 3-minute breathing space not only three times a day but at any time noticing tension with unpleasant emotions
Fifth	Sitting meditation (thoughts are not facts)	Guided sitting meditation
Sixth	Sitting meditation visualization	Shorter guided meditation for at least 40 minutes in vague scenarios, 3-minute breathing three times a day at any stressful or difficult time
Seventh	Sitting meditation refers to the connection between mood and activity (self-care)	Discuss the symptoms of relapse, breathing for 3 minutes three times a day at any time facing tension or difficult emotions
Eighth	Physical examination	Experiences and responses to exercises can change over time and in the light of new learning. Reflection; Feedback (getting feedback from participants) Performing a post-test

Results

In Table 2, descriptive indicators of research variables including mean and standard deviation have been reported in pre-test and post-test are divided into groups.

Table 2. descriptive indicators of research variables in pre-test and post-test

Variable	Situation	Group	Number	Mean	Exponent	Extent	The standard deviation
Undeveloped defense mechanisms	Pre-test	Experiment	20	126.01	126	126	5.11
	Post-test	Control	20	124.50	127	111	8.76
	Pre-test	Experiment	20	90.00	90	91	4.65
	Post-test	Control	0	124.55	126	126	8.62
Developed defense mechanisms	Pre-test	Experiment	20	42.60	44	44	6.28
	Post-test	Control	20	42.35	44	38	9.38
	Pre-test	Experiment	20	53.80	55.50	59	5.65
	Post-test	Control	20	43.30	43	31	9.38
Psychodetic	Pre-test	Experiment	20	47.50	48	49	5.88
	Post-test	Control	20	48.90	50	41	7.67
	Pre-test	Experiment	20	36.95	37	39	5.04
	Post-test	Control	20	48.05	49	39	6.84

Since defense mechanisms exist at three levels: mature, psychotic, and immature simultaneous multivariate analysis of variance was used to test this hypothesis.

Table 3. Box statistic results related to covariance matrix parity

Box's M	F	Df1	Df2	P
3.30	0.58	6	10462	0.59

According to Table 3, the results of the M-box test shows that the value of F is equal to 3.30, which is not significant at the level error of 0.05%, so the observed covariance matrix of dependent variable groups is equal.

Therefore, the hypothesis of homogeneity of the covariance matrix has been observed for the research data ($p > .05$).

Table 4. Levene's test results

Variable	F	DF1	DF2	P
Undeveloped mechanisms	0.502	1	38	0.482
Developed mechanisms	1.48	1	38	0.230
Psychologically disturbed mechanisms	3.74	1	38	0.060

According to Levin test results none of the F values were significant for the variables, so the use of parametric tests is unobstructed. As a result, the

hypothesis of the difference between the Covariance has been established.

Table 5. Results of credit indicators of multivariate analysis of covariance significance test

Contributions	Examination	Amount	F	Hypothesis DF	Error DF	P	Contributions
Group	Play effect	0.962	281.08	3	33	0.01	0.962
	Wilks Lambda	0.038	281.08	3	33	0.01	0.962
	Hotline effect	25.55	281.08	3	33	0.01	0.962
	The biggest root of the error	25.55	281.08	3	33	0.01	0.962

The results of the table represent that the significance levels of all tests allow to use multivariate analysis of covariance. These results show that there is a significant

difference between the experimental group and the control group in terms of at least one of the dependent variables.

Table 6. Results of multivariate analysis of covariance of group differences

Source	Variable	SS	DF	MS	F	P	Contributions
Group	Undeveloped mechanisms	12043.72	1	12043.72	712.72	0.01	0.953
	Developed mechanisms	1037.65	1	1037.65	100.70	0.01	0.742
	Psychologically disturbed mechanisms	1014.35	1	1014.35	54.69	0.01	0.610

According to Table 6 and the results of multivariate analysis of covariance, the difference between the group's mean regarding immature mechanisms with a value of $F = 712.72$ is significant at the alpha level of 0.01. This finding shows that there is a significant difference between the experimental group and the control group in underdeveloped defense mechanisms and the mean of the experimental group is significantly lower than the control group. The difference between the means of the groups regarding the developed mechanisms with $F = 100.70$ is significant at the alpha level of 0.01. This finding shows that there is a significant difference between the experimental group and the control group in the developed defense mechanisms and the mean of the experimental group is significantly higher than the control group. The difference between the means of the groups regarding the psychiatric mechanisms with a value of $F = 54.69$ is significant at the alpha level of 0.01.

Discussion

Mindfulness is an unconditional, balanced sense of consciousness that helps to see and accept emotions and physical phenomena clearly. Mindfulness training is taught through breathing and thinking with the aim of reducing stress and various disorders in which the mental representation of objects in life is out of human control. Mindfulness training reduces psychological distress and symptoms of anxiety and depression and improves mental, physical, emotional, and spiritual well-being, improves sleep quality, and reduces physical

symptoms. In such situations people face less stress and use more efficient mechanisms (Evans et al., 2008; Flugel et al., 2010).

Defense mechanisms refer to a set of extensive, unconscious, and automated efforts that a person uses in the face of internal and external stress to maintain their psychological stability through injury and modification of how they perceive reality. The performance of these defenses can be adaptive or incompatible. Undeveloped and avoidant defense mechanisms such as refutation, denial, and rationalization can distort and alter emotional perception since it distorts our attention to reality and distracts us from problems (Malone et al., 2013; Pervichko and Zinco, 2014). Mindfulness therapy states that you accept what is beyond your control and commit to an action that enriches your life. This helps the person to create a rich, complete and meaningful life (Faustino et al., 2020). Therefore, in the effect of mindfulness therapy on reducing the use of underdeveloped defense style it can be said that when a person's dominant defense style is neurotic and underdeveloped, he usually faces the issue of stress and stressful situation through denial, neglect, and ignorance (Co, Aversano, et al., 2020; SLysa, 2015). In the mindfulness treatment participants are encouraged to declare their commitment and move toward a healthier life that includes behavioral actions even when they are facing with obstacles such as negative thoughts and feelings.

In this treatment each action is compared and analyzed with its function in the mind. This approach includes both acceptance strategies and behavioral

commitment to change. According to the fact that inhibiting unwanted thoughts increases the frequency of these thoughts, mindfulness therapy reduces avoidance by encouraging acceptance and reduction of verbal language and direct reference to the consequences of excessive avoidance. Thus, it can be argued that thoughts and feelings that were reinforced by avoidance and inhibition will be less pronounced once they are accepted (Manicavasgar et al., 2011; Kabat Zayn, 2002; Fulton et al., 2005).

In mindfulness treatment the greatest effort is to prevent the rumination process in problem-solving which has many lasting unpleasant effects (Crane, 2009; Tang, Holzel, & Posner, 2015). Intellectualism reduces overgeneralization in narrative memory and critical self-evaluations and enhances useful cognitive processes such as non-judgmental observation of mental content. In this way clients are encouraged to process the experience without judgment as it is formed, change their relationship, and accept challenging thoughts and feelings (Segal et al., 2002; Switzerland et al., 2015). Therefore, according to the above research mindfulness is deployed as a way to prevent the accumulation of unconscious processes, hidden motivations, and invisible structures of the mind as well as using learning principles to correct unnecessary behaviors and emotional reactions. From another perspective mindfulness will be considered as a special way of cultivating attention to developing consciousness. Mindfulness training also includes the ability to identify problematic or disturbing aspects of thought and establish a relationship with a different approach to these thoughts (Neff, 2003; Abolghasemi and Najarian, 2009; Faustino et al., 2020; Kabat Zayn, 2015). One of the effective mechanisms in mindfulness is the change of self-awareness and self-perception. Mindfulness training leads patients to accept themselves as they are despite their flaws and shortcomings. The process of meditation in mindfulness helps patients to get on well with themselves by accepting and giving up the negative emotions of their flaws and shortcomings. Establishing a more efficient relationship with oneself can lead patients to use efficient and developed defense mechanisms in the face of stressful situations and less inefficient mechanisms (Tang et al, 2015). Hence, mindfulness by focusing on self-processing functions reduce suffering and create a sustainable mind. Within this framework mindfulness decreases the distorted or biased sense of self as well as one's relation to others and the external world. Employing specific forms of mindfulness practices develop a meta-awareness of self and an ability to manage or alter one's responses and impulses effectively. Also it leads to the development of a positive relationship between the self and others that transcends self-focused needs and increases prosocial characteristics (Hadash, Plonsker, Vago, & Bernstein,

2016).

Conclusion

Due to the fact that self-defense has been conceptualized as a psychological mechanism for managing debilitating emotions, the inability to regulate and manage emotions result in developing immature defense styles against problems. If processing emotional information is properly understood and evaluated, the organization of a person's emotions and cognitions will function optimally and as a result the possibility of using adult defense mechanisms increases in stressful situations. The use of mature defense mechanisms, in turn, increases person's emotional management capacity. In this way individuals create immunity against physical and mental disorders not by suppressing and controlling emotions severely, but dealing rationally with tensions and responding appropriately to emotions (Connersano et al., 2020; Asgharkhah, & Shareh, 2017).

The implementation of this study on a small sample of people with MS in Urmia can limit the generalization of results to all MS patients. It is recommended that future research can be conducted on a larger number of patients including men and women in different cities. Thus, by comparing mindfulness treatment with other psychological therapies the best treatment method to reduce the complications of this disease is determined.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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