DOI: 10.22122/ijbmc.v6i2.160 Published by Vesnu Publications

International Journal of Body, Mind & Culture
Cross-Cultural, Interdisciplinary Health Studies

The Effectiveness of Mindfulness-Based Cognitive Therapy on Life Expectancy and Depression in Patients with Multiple Sclerosis

Shirin Haji-Adineh[1], Atieh Farzanfar[2], Shahnaz Salehi-Morakani[3], Mohammad Vahidi[4], Maryam Kalhornia-Golkar[5]

[1] MSc, Department of General Psychology, Kish Branch, Islamic Azad University, Kish, Iran
[2] MSc, Department of General Psychology, Varamin-Pishva Branch, Islamic Azad University, Varamin, Iran
[3] MSc, Department of Psychology, Tehran North Branch, Islamic Azad University, Tehran, Iran
[4] PhD Student, Department of Family Counseling, Tehran North Branch, Islamic Azad University, Tehran, Iran
[5] Assistant Professor, Department of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran

Quantitative Study

Abstract

Background: Multiple sclerosis (MS) is one of the most common diseases of the central nervous system (CNS) that can affect life expectancy and depression in patients suffering from this disease. The aim of this study was to determine the effectiveness of mindfulness-based cognitive therapy (MBCT) on life expectancy and depression in patients with MS.

Methods: The study adopted a pretest-posttest research design with a control group. The statistical population included all patients with MS enrolled in the MS Society of Tehran, Iran, from 2009 to 2016. Using simple random sampling, 30 subjects were assigned to two experimental and control groups. The research tools included the Life Expectancy Questionnaire (LEQ) and Beck Depression Inventory (BDI). Data were analyzed using univariate analysis of covariance in SPSS software.

Results: MBCT training led to significantly higher life expectancy in the experimental group with a greater mean life expectancy in the experimental group than the control group ($P < 0.01$; $F = 42.22$). Moreover, MBCT training reduced depression in the experimental group with a higher mean depression score than that of the control group ($P < 0.0001$; $F = 22.53$).

Conclusion: It can be concluded that MBCT training increased life expectancy and decreased depression in the experimental group.

Keywords: Mindfulness-based cognitive therapy, Life expectancy, Depression, Multiple sclerosis

Citation: Haji-Adineh S, Farzanefar A, Salehi-Morakani S, Vahidi M, Kalhornia-Golkar M. **The Effectiveness of Mindfulness-Based Cognitive Therapy on Life Expectancy and Depression in Multiple Sclerosis Patients.** Int J Body Mind Culture 2019; 6(2): 79-86.

Received: 15 Jan. 2019
Accepted: 25 Mar. 2019

Introduction

Multiple sclerosis (MS) is one of the most common diseases of the central nervous system (CNS) in young people. This chronic and progressive disease damages the brain myelin tissue and spinal cord, and leads to a wide

Corresponding Author:
Atieh Farzanfar
Email: atieh.farzanfar@gmail.com

range of neurological symptoms such as blurred vision, muscular weakness, and sensory impairment (Kenner, Menon, & Elliott, 2007). Neurological symptoms initially include atony, ataxia, diffuse sensory and motor disturbances, and visual changes (McCabe, 2005). Some studies have focused on viral infection and immune system dysfunctions (Rasova, Havrdova, Brandejsky, Zalisova, Foubikova, & Martinkova, 2006). The presentation of MS varies from a benign disease to a rapidly progressive and debilitating disease (Rickards, 2005). MS influences the life expectancy level, and patients live with its symptoms and consequences for many years (Tepavcevic, Kostic, Basuroski, Stojsavljevic, Pekmezovic, & Drulovic, 2008). This disease poses a permanent challenge for individuals and their families, causing energy depletion, and reduced movement vigor and family activities, and is a costly disease in many respects (Kenner et al., 2007). In a clinical study, Langgartner stated that the most important support for MS patients may be the support provided by family members and friends, who can provide them with physical and psychological support on a daily basis. The provision of the support required by the patients, however, is considered a great effort for family members, and they may spend a great deal of their energy on this task. A high rate of perceived family support and regular and energetic entertainments can make the disease tolerable and increase the life expectancy of these patients and their family members. Regarding the variable role of hope in tolerance and improvement of some diseases, a study showed that adolescents with depressive symptoms or other emotional or behavioral problems had lower hope (Rajabi & Abasi, 2012). Hope has existed since the advent of mankind. When one is convinced that the future is generally saddening and absurd, he/she may lose the will to tolerate the present moment. According to Augustine, "Hope deals only with good things and the future and has a direct relationship with a hopeful person." When the goal of hope is fulfilled, it is no longer hope, but it becomes one's property, and hope creates the ability not to be affected by problems in the present moment. It also results in openness to new opportunities (Melyani, Alahyari, Azadfallah, Fathi Ashtiani, & Tavoli, 2014). Schneider believes that hope is the process by which people first determine their goals. Then, they create solutions to achieve those goals, and then, create the incentive to implement these strategies and maintain them (Melyani et al., 2014).

Fatigue and depression are considered as two important factors in MS-related cognitive dysfunction. Many studies have shown that MS patients present with declined cognitive function and increased fatigue, though these observations are not widespread in patients. Moreover, depression was considered as a factor in cognitive impairment in the disease (Gilbert & Procter, 2006; Grossman, Niemann, Schmidt, & Walach, 2004). Even though many MS patients with cognitive impairment do not demonstrate high levels of active adaptation and low levels of social adjustment as symptoms of depression, some of them have low levels of social adjustment and accountability (Gilbert & Procter, 2006). Feinstein (2002) stated that major depression in patients with obsessive-compulsive disorder (OCD) had negative effects on life expectancy and quality of life (QOL) in MS patients, and that it was a key factor in reducing the prevalence of suicide in these individuals (Papageorgiou & Wells, 2004; Kozak, 2008). García and Feinlai Saun (2007) conducted a study on 2700 patients with MS and noted that many of these patients did not receive much support and help, and suffered from various emotional disturbances (Papageorgiou & Wells, 2004).

Bohlmeijer, Prenger, Taal, & Cuijpers, 2010; Kabat-Zinn, & Hanh, 2009). In another study, 44% of the elderly individuals studied reported that they experienced depression and presented with abnormalities in their memory and mental health (Kabat-Zinn & Hanh, 2009).

As a lifestyle, mindfulness through the use of meditation exercises integrated in everyday life helps people to become familiar with their dual mindsets and consciously use them as an integrated mind. With this method, people realize that they do not only think, but they can see their thinking. Through formal meditations (such as breathing and body meditation, conscious yoga meditation, and body scan meditation), informal meditations (such as eating, walking, showering, etc.) and habit-breaking exercises, people learn to live in the "here" and "now" (Stahl, Goldstein, Kabat-Zinn, & Santorelli, 2010). Studies have associated mindfulness training with various health outcomes such as pain (Stahl et al., 2010), anxiety, depression, and stress relief (Kabat-Zinn, 2003). Stahl et al. (2010) also showed that mindfulness techniques were effective in increasing muscle relaxation and reducing anxiety and stress. They further indicated that mindfulness-based treatment could effectively increase muscle relaxation and reduce anxiety and depression in physical patients (Stahl et al., 2010; Kabat-Zinn, 2003). Mindfulness-based cognitive therapy (MBCT) resulted in improved symptoms of stress and anxiety, and increased self-esteem (Zeidan, Johnson, Diamond, David, & Goolkasian, 2010). The variety of interventions shows that there are many potential methods that can help people with MS. Psychosocial interventions help to reduce or manage psychosocial challenges and create hope in patients with MS (Stahl et al., 2010). According to the abovementioned facts, it can be argued that recognition of effective psychological variables and the implementation of various psychotherapy methods, including MBCT, can be useful for these patients. The main objective of this study, therefore, was to determine the effectiveness of MBCT on the life expectancy of patients with MS.

Methods

The present study was a quasi-experimental pretest-posttest research with a control group and random assignment to the experimental group. The statistical population included all patients with MS enrolled in the MS Society of Tehran, Iran, from 2009 to 2016. In total, 30 patients were selected using convenience sampling method and according to the Krejcie-Morgan (1970) table. The researcher referred to the MS Society of Tehran and made the necessary coordination. After an explanatory session on the research overview and objectives, samples were selected from among all those who were willing to participate in the study, and randomly assigned to two groups of 15 subjects. The two groups were matched for age and education, followed by the random determination of an experimental group and a control group. At the completion of the treatment, a posttest was performed (two months after the pretest), and the follow-up session (last intervention session) was held for the test group one month after the posttest. The inclusion criteria were membership in the MS Society of Tehran and at least 1 year of disease history. The exclusion criteria were a history of mental illness and complications associated with MS. All subjects in both groups were fully involved in the research until the end of the study, and there was no drop in the number of subjects. To increase the participation of individuals in this research, contact numbers were obtained from all individuals and the day and time of sessions were coordinated with all the members to ensure the attendance of all participant.

The experimental group received MBCT, and the control group received no treatment. Both groups were evaluated using the Life Expectancy Questionnaire (LEQ) (Mousavi & Ghorbani, 2006) and Beck Depression Inventory (BDI) before and after the intervention. Then, the experimental group was subjected to treatment. The MBCT plan was implemented in 8 sessions (1 session per week), each lasting approximately 90 minutes.

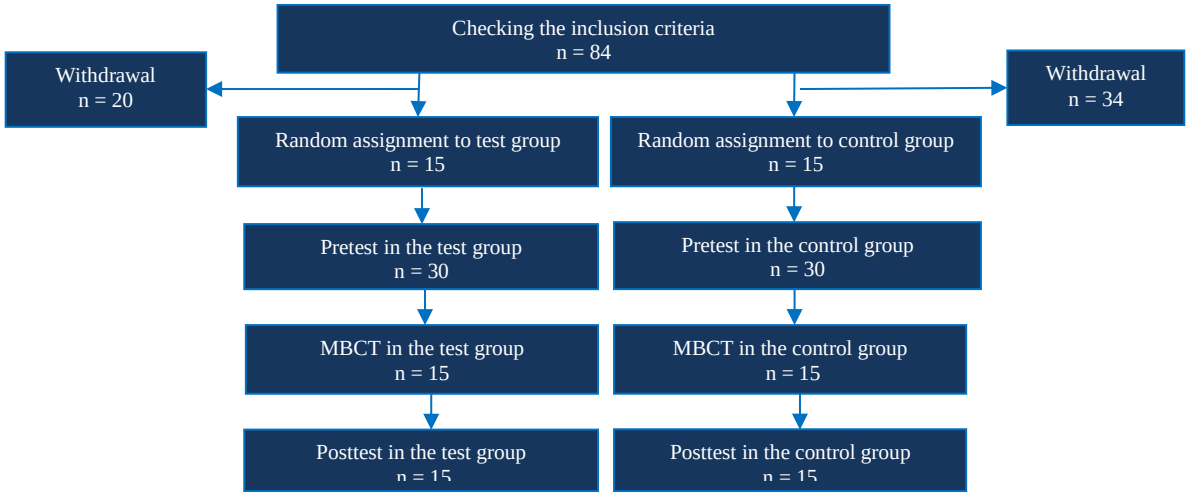

Figure 1. The CONSORT chart of entering the research

All subjects received written information about the study and provided consent for participation in the research. They were assured of the confidentiality of all information and the use of data for research purposes. Moreover, the subjects' names and surnames were not registered to observe their privacy. Figure 1 shows the CONSORT chart of entering the research.

Research tools

Life Expectancy Questionnaire: The life expectancy of patients with MS was measured using the LEQ developed by Hezarossi (Mousavi & Ghorbani, 2006). This questionnaire consists of 70 questions scored on a 4-point Likert scale. In addition to life expectancy, this questionnaire also evaluates the M (significance) and R (responsibility) scales each with 28 and 19 questions, respectively. There is a correlation between low scores on M and R scales of the LEQ and high scores on D scale of the Minnesota Multiphasic Personality Inventory (MMPI) (Mousavi & Ghorbani, 2006). The formal validity of the LEQ was confirmed by Hezarossi. Furthermore, a reliability coefficient of 0.89 was obtained for the LEQ using Cronbach's alpha based on its implementation on a community of 62 people (Mousavi & Ghorbani, 2006). In this study, a significant Cronbach's alpha of 0.87 was obtained for this questionnaire.

Beck Depression Inventory (BDI): The BDI was designed by Aaron Beck to measure the feedback and symptoms of depressed patients. It consists of 21 items, which are based on the observation and demonstration of common attitudes and symptoms among depressed psychotic patients. BDI is a kind of self-assessment test completed in 5-10 minutes. The test consists of totally 21 items associated with different marks. to the items are scored based on a 4-point scale ranging from 0 to 3. These items are related to areas such as sadness, pessimism, feelings of disability and failure, sense of guilt, insomnia, anorexia, self-denial, etc. As such, 2 items are devoted to affection, 11 items to cognition, 2 items to obvious behaviors, 5 items to physical signs, and 1 item to interpersonal semiotics. Accordingly, this scale determines different degrees of depression from mild to extremely severe and its score ranges from a minimum of 0 to a maximum of 63 (Beck, Steer, & Carbin, 1988). A high internal consistency coefficient of 0.89 was obtained for this scale using Cronbach's alpha (Beck et al., 1988). A Cronbach's alpha of 0.87 was achieved for this questionnaire in the present study.

In addition to descriptive statistics, data were analyzed using univariate analysis of covariance (ANCOVA) in SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

A summary of the MBCT sessions is presented in table 1.

Table 1. Summary of MBCT sessions

Session description	Session goal	Session time
Session 1: Welcoming and introducing members, expressing the general structure of sessions and the study process, contracting treatment, explaining the general objective and some subjects on MS, and explaining the tasks	Introduction and familiarization of groups, explaining the rules	90
Session 2: Examining tasks, informing the members of the basic concepts of logotherapy, providing an understanding and perception of the meaning of life, reviewing the executed tasks, providing a concise account of Frankl's biography and a concise explanation of the fundamental beliefs of logotherapy, holding a group discussion on life and its meaning, explaining the tasks	Perception of life meaning	90
Session 3: Reviewing the tasks, informing the patients of meaning in life methods, providing an understanding and perception of the meaning of life, holding a group discussion on the meaning of life, and explaining the tasks	Dealing with the meaning of life	90
Session 4: Reviewing the tasks, adopting individual freedom and accountability, reviewing the tasks, all members explaining their meaningful past experiences, receiving feedback from each other and the therapist, holding a group discussion on freedom and accountability, the therapist providing an outline of the concepts of freedom and responsibility, and relating each concept to the reality of the members' lives, and explaining the tasks	Discussion on the adoption of individual freedom and accountability	90
Session 5: Reviewing the tasks, providing a perception and understanding of the meaning of love, reviewing the assignments, and addressing accountability, group discussion on love and its meaning, the therapist providing a conclusion (definition of love, love categorization, and loving practices), and explaining the assignments	Perception and understanding the meaning of love	90
Session 6: Reviewing the tasks, providing a perception and understanding of the suffering and pain of patients with MS, reviewing the tasks of previous sessions based on personal experiences of members regarding love, holding a group discussion on agony and the meaning learned from it, the therapist drawing a conclusion, and explaining the assignments	Understanding and perceiving the meaning of agony	90
Session 7: Reviewing the assignments and addressing the meaning of agony, the participants expressing their views about death in the past, reviewing the assignments, the participants addressing their dealing with life meaning, the therapist drawing a conclusion, and explaining the assignments	Addressing the meaning of life and finding meaning in suffering	90
Session 8: Reviewing assignments, providing the positive meaning of MS, concluding the previous statements, hearings, readings, and findings of the clients, the feedback, and termination, reviewing of the assignments from the previous meeting based on the experiences of the members on seeking their inner world and communication with the sacred and spiritual parts of their being, and receiving feedback from the group, reviewing the assignments of the previous meeting and presenting a summary of the previous findings	Conclusion and termination of the intervention	90

Results

There were 7 (46.7%) men and 8 (3.53%) women in each group. The mean (± standard deviation) ages of the subjects in the experimental and control groups were 33.1 ± 9.1 and 31.5 ± 8.4 years , respectively.

Table 2 presents the descriptive analysis of the pretest and posttest scores of life expectancy and depression in patients with MS. Based on the results, the average posttest life expectancy score increased in the test group, but it was almost constant in the control group. In addition, the mean posttest depression score decreased in the experimental group, but it was almost constant in the control group.

Table 2. Descriptive findings of the research variables

Variables		Life expectancy	Depression
		Mean ± SD	Mean ± SD
Pretest	Experimental	183.15 ± 15.17	23.9 ± 6.75
	Control	187.4·± 17.8	22.01 ± 7.70
Posttest	Experimental	194.15 ± 13.7	20.10 ± 5.27
	Control	189.22 ± 15.1	24.93 ± 7.07

Among the scales related to the life expectancy and depression, Levene's test showed no significantly difference in any of the scales.

Table 3. Results of analysis of covariance of adjusted mean differences for life expectancy scores in the two groups

Source of variance	Sum of squares	df	Mean squares	F	P	ηp²	Test power
Pretest stage	5199.39	1	5199.39	91.62	0.0001	0.72	1.00
Group	4791.98	1	2395.99	42.22	0.0001	0.70	1.00
Error	2043.93	26	65.75				

; accordingly, the two groups were homogeneous in terms of the research variables before the intervention (P > 0.05). The assessment of the normal distribution of data indicated that both life expectancy and depression scales followed the assumption of normal distribution (P > 0.05). Moreover, the homogeneity examination using regression analysis showed no significance in either scale (P > 0.05).

Based on the results presented in table 3, H0 is rejected because the amount of calculated F (42.22) with df values of 1 and 26 is larger than that in the table. This confirms the research hypothesis (with 0.99 confidence), stating that MBCT training has an effect on the life expectancy of patients with MS. Furthermore, based on the results presented in table 4, the mean posttest scores of the experimental group increased significantly compared to the control group. The effect index shows that a 70% increase in the life expectancy of patients with MS in the experimental group can be attributed to MBCT training.

Moreover, the pretest control revealed significant differences in terms of depression between the patients in the experimental and control groups (P < 0.0001; F = 22.53). In other words, MBCT training reduced depression in the experimental group based on the mean depression score in the experimental group compared to that of the control group. The effect index or difference is equal to 0.48 meaning that 48% of individual differences in posttest scores are related to the fear of failure in the impact of MBCT training.

Discussion

The results of this study show that MBCT training has an impact on life expectancy in patients with MS, which is consistent with the findings of Brennan, Emmerling, and Whelton (2014), Gilbert and Procter (2006), and Kozak (2008). Therefore, it can be concluded that the achievement of a meaningful living requires self-knowledge in the first stage and attainment of a coherent definition of oneself. Therefore, one must adopt a coherent framework from the various governing views in the environment to grant a meaning to one's life and the world. In fact, when there is hope in life, one will not suffer from absurdism, futility, despondency, and frustration, and will be more capable of dealing with difficulties and failures. The presence of meaning in life requires that values, goals, and criteria be processed, evaluated, and structured carefully and meticulously. With obtaining more hope in this area, people gain more success and receive positive feedback from society.

To explain this finding, it can be stated that MBCT training affects life expectancy and teaches skills such as suitable methods of communication. Thereby, it allows an individual to improve his/her ability to act according to his/her own criteria and to achieve the desired outcomes in a special situation. In addition, it increases one's knowledge and strengthens one's positive beliefs.

Table 4. Results of analysis of covariance of mean differences adjusted for depression scores in the two groups

Source of variance	Sum of squares	df	Mean squares	F	P	ηp²	Test power
Pretest stage	435.70	1	435.70	2.057	0.0001	0.54	0.87
Group	568.14	1	568.14	22.53	0.0001	0.48	0.72
Error	529.36	25	21.17				

All of these prevent the emergence of factors that impair one's mental health since most psychiatric disorders seem to emerge from the inadequacy to act in accordance with one's own criteria followed by failure to achieve expected outcomes and lack of adequate knowledge and misguided beliefs about oneself and the surrounding world. Training increases individuals' awareness of themselves, helps them recognize their strengths and weaknesses and achieve some kind of self-knowledge by which to correct their weaknesses and increase their strengths; as a result, one better accepts the facts.

Depression is often a cognitive process that can be explained in the form of mental rumination (Stahl et al., 2010) as a defense. If the error and failure to achieve the goal is compensable, it leads to an instructive action, and if it cannot be compensated, it will be experienced by tolerating excitements consistent with error and failure in an unstable and current form. Therefore, continuation of depression as a cognitive process is nothing but a defense to relieve the painful excitements of sin and regret (Brennan et al., (2014). It seems that MBCT exercises increase the consciousness of individuals in the present moment through such techniques as attention to the self and body, and influence the cognitive system and processing of information by focusing consciously on the here and now. Therefore, the effectiveness of this type of training is associated with advantages in the area of depression, stress, and anxiety. Moreover, considering that patients with MS are in a critical and tempestuous state, extensive use of this treatment is recommended for patients with MS (Kabat-Zinn, 2003).

One of the limitations of this research is that it was conducted on members of the the MS Society of Tehran. Based on our findings that implicate the effectiveness of MBCT training on life expectancy, the implementation of MBCT training to improve patients' living conditions in specialized centers and hospitals as well as by relevant physicians is recommended, in addition to existing medical services. This is because life expectancy and physical illness are mutually interacting, and life expectancy usually determines the patient's attention to his/her physical condition.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

The researchers feel obliged to express their gratitude to all those involved in the implementation of this research, and all the study participants.

References

Ahamadi Tahoor, M., Jafari, I., Karami Nia, R., & Akhavan, H. (2010). the effect of positive and negative perfectionism and type D personality on general health of the aged. *Avicenna J Clin Med*, *17*(3), 64-69.

Beck, A. T., Steer, R. A., & Carbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review*, *8*(1), 77-100.

Bohlmeijer, E., Prenger, R., Taal, E., & Cuijpers, P. (2010). The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: a meta-analysis. *J Psychosom.Res*, *68*(6), 539-544. doi:S0022-3999(09)00415-2 [pii];10.1016/j.jpsychores.2009.10.005 [doi]. Retrieved from PM:20488270

Brennan, M. A., Emmerling, M. E., & Whelton, W. J. (2014). Emotion-focused group therapy: Addressing self-criticism in the treatment of eating disorders. *Counselling and Psychotherapy Research*, *15*(1), 1-9.

Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy*, *13*(6), 353-379.

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits. A meta-analysis. *J Psychosom.Res*, *57*(1), 35-43. doi:10.1016/S0022-3999(03)00573-7 [doi];S0022399903005737 [pii]. Retrieved from PM:15256293

Kabat-Zinn, J., & Hanh, T. N. (2009). *Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness*. New York, NY: Random House Publishing Group.

Kabat-Zinn, J. (2003). Mindfulness-Based Interventions in Context: Past, Present, and Future.

Clinical Psychology: Science and Practice, *10*(2), 144-156.

Kenner, M., Menon, U., & Elliott, D. G. (2007). Multiple sclerosis as a painful disease. *Int Rev.Neurobiol.*, *79*, 303-321. doi:S0074-7742(07)79013-X [pii];10.1016/S0074-7742(07)79013-X [doi]. Retrieved from PM:17531847

Kozak, A. (2008). Mindfulness in the management of chronic pain: conceptual and clinical considerations. *Tech Reg Anesth Pain Manag*, *12*(2), 115-118.

McCabe, M. P. (2005). Mood and self-esteem of persons with multiple sclerosis following an exacerbation. *J Psychosom.Res*, *59*(3), 161-166. doi:S0022-3999(05)00105-4 [pii];10.1016/j.jpsychores.2005.04.010 [doi]. Retrieved from PM:16198189

Melyani, m., Alahyari, A. A., Azadfallah, p., Fathi Ashtiani, A., & Tavoli, A. (2014). Miulness based Cognitive therapy versus Cognitive Behavioral therapy on predictors of relapse in recurent Depression. *Clinical Psychology and Personality*, *2*(10), 75-86.

Mousavi, A. S., & Ghorbani, N. (2006). Self-knowledge, self-criticism and mental health. *Journal of Psychological Studies*, *2*(3), 75-91.

Papageorgiou, C., & Wells, A. (2004). *Depressive Rumination: Nature, Theory and Treatment*. Chichester, UK: John Wiley & Sons.

Rajabi, G., & Abasi, G. (2012). An investigation of relationship between self-criticism, social interaction anxiety, and fear of failure with internalized shame in students. *Research In Clinical Psychology And Counseling (Studies In Education & Psychology)*, *1*(2), 171-182.

Rasova, K., Havrdova, E., Brandejsky, P., Zalisova, M., Foubikova, B., & Martinkova, P. (2006). Comparison of the influence of different rehabilitation programmes on clinical, spirometric and spiroergometric parameters in patients with multiple sclerosis. *Mult.Scler.*, *12*(2), 227-234. doi:10.1191/135248506ms1248oa [doi]. Retrieved from PM:16629428

Rickards, H. (2005). Depression in neurological disorders: Parkinson's disease, multiple sclerosis, and stroke. *J Neurol Neurosurg.Psychiatry*, *76 Suppl 1*, i48-i52. doi:76/suppl_1/i48 [pii];10.1136/jnnp.2004.060426 [doi]. Retrieved from PM:15718222

Stahl, B., Goldstein, E., Kabat-Zinn, J., & Santorelli, S. (2010). *A Mindfulness-Based Stress Reduction Workbook*. A new Harbinger publications self-help workbook. Oakland, CA: New Harbinger Publications.

Tepavcevic, D. K., Kostic, J., Basuroski, I. D., Stojsavljevic, N., Pekmezovic, T., & Drulovic, J. (2008). The impact of sexual dysfunction on the quality of life measured by MSQoL-54 in patients with multiple sclerosis. *Mult.Scler.*, *14*(8), 1131-1136. doi:1352458508093619 [pii];10.1177/1352458508093619 [doi]. Retrieved from PM:18632783

Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: evidence of brief mental training. *Conscious.Cogn*, *19*(2), 597-605. doi:S1053-8100(10)00068-1 [pii];10.1016/j.concog.2010.03.014 [doi]. Retrieved from PM:20363650