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Comparison of the Efficacy of Cognitive-Behavioral Therapy and Acceptance and Commitment Therapy in Reducing Depression in Women with Multiple Sclerosis

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Quantitative Study

Abstract

Background: The goal of the present study was to compare the efficacy of cognitive-behavioral therapy (CBT) and acceptance and commitment therapy (ACT) in reducing depression in women with multiple sclerosis (MS).

Methods: This was a quasi-experimental research with a pretest-posttest design and control group. Among female patients with MS suffering from depressive symptoms attending the Iran MS Society in 2015, a total of 45 patients were selected as the study sample and randomly divided into 3 groups (CBT, ACT, and Control groups) of 15 individuals. The interventions were provided in 8 sessions, each 45 minutes long. The study data were gathered using the Beck Depression Inventory (BDI) and analyzed using SPSS software.

Results: Both CBT and ACT were effective in reducing depression in patients with MS (P < 0.001). However, CBT was more effective than ACT for this purpose.

Conclusion: According to the study results, both CBT and ACT are effective interventions for reducing depression in patients with MS. Given that CBT was more effective than ACT for this purpose, we suggest that it be used as the preferred treatment for depression in patients with MS.

Keywords: Cognitive-behavioral therapy, Acceptance and commitment Therapy, Multiple sclerosis, Depression

Introduction

Multiple sclerosis (MS) is one the most prevalent neurodegenerative and inflammatory disorders affecting the central nervous system (CNS). MS has a wide variety of symptoms influencing visual, motor, and sensory functions, coordination, balance, bowel and bladder function, and sexual activity (Chwastiak & Ehde, 2007). In terms of age, MS often begins between late 20's and early 30's with a peak between the ages of 55 to 64 years (Patten, Beck, Williams, Barbui, & Metz, 2003). Among psychological symptoms, anxiety and

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depression are common in patients with MS, and are related to social dysfunction, reduced adherence to treatment, psycical complaints, and lower level of functioning (Chwastiak & Ehde, 2007). Depression is the most common psychiatric disorder in patients with MS (Wallin, Wilken, Turner, Williams, & Kane, 2006). Research has shown that about 50-60% of patients with MS suffer from depression and about 25-40% experience severe depression that negatively affects their quality of life (QOL) and resilience (Omrani, Mirzaeian, Aghabagheri, Hassanzadeh, & Abedini, 2012).

Depression and exhaustion are common symptoms of MS, and MS usually affects the QOL of patients (Ziemssen, 2009). Hopelessness also increases the risk of depression and neurological problems in patients with MS (van der Werf, Evers, Jongen, & Bleijenberg, 2003). Stress, anxiety, and depression are prevalent in patients MS to the extent that can endanger their health (Dehghan & Memarian, 2013). Emergence of depression during the course of MS is clinically significant (Moore, Hirst, Harding, Clarkson, Pickersgill, & Robertson, 2012). Not only is depression part of the clinical manifestation of MS, but it is also a major determinant of reduced QOL in patients with MS. Depression also increases the risk of thinking errors and suicidal ideation, often impairs interpersonal relationships, and reduces patient's ability to cope with their illness. Despite these negative effects, depression is a treatable condition (Moore et al., 2012).

These patients' difficulty in controlling their emotions is caused by the deterioration of myelin sheaths of a region of the brain that is responsible for controlling emotions. The treatment process, unpredictable relapses, reduction in previous abilities, problems like job loss, and finally, the side-effects of the drugs used to treat MS are factors that may lead to depression that can affect various aspects of the patients' lives (Abramovitz, 2004). One of these aspects is patients' reduced ability to effectively cope with life difficulties. This reduction in the coping

ability can, in turn, lead to more severe depression symptoms, and this vicious cycle continues (Arnett, Higginson, Voss, Randolph, & Grandey, 2002). The severity of depression can have devastating effects on the physical (Pittion-Vouyovitch, Debouverie, Guillemin, Vandenberghe, Anxionnat, & Vespignani, 2006) and cognitive abilities of patients with MS, and increases the risk of relapse (Sanchez Lopez, Olivares, Nieto, Hernandez Perez, & Barroso, 2004). The pattern of disease activity and the treatment process are very different in patients with MS and depression compared to those without depression or with controlled symptoms (Wineman, Schwetz, Zeller, & Cyphert, 2003). On the other hand, hopelessness that prevents the patient from effective coping and continuing the treatment may necessitate more pharmacotherapy and even longer hospitalization in the next attack of the disorder (Patten & Metz, 2002). The wide range impairments can increase the risk of suicide in patients with the goal of ending their pain (Mokhtari, 2004). Among the unpleasant outcomes of depression in patients with MS are continued sadness, hopelessness about the future, repetitive thinking about disability and disablement, and ongoing preoccupation with negative thoughts that can lead to excessive behaviors like committing suicide (Mokhtari, Neshat Doost, & Molavi, 2008).

A previous study has shown that depression can worsen the impact of MS complications on the QOL of patients (Leonavi & Adomaitien, 2012). Patients with MS who also suffer from depression report significantly higher interference of MS symptoms with their social, work, and family activities compared to those without depression. In fact, patients with MS who report interference of MS symptoms with their family life are 7 times as likely to be diagnosed with depression compared to those who do not report such interference. Evidently, the combination of depression and MS-related problems can severely impair the

QOL and normal functioning of the patients. Therefore, treating depression in patients with MS is necessary for their physical and mental health. Mohr, Boudewyn, Goodkin, Bostrom, and Epstein (2001) showed that psychotherapy based on improving coping skills can be more effective than acceptance and commitment Therapy (ACT). In their meta-analysis, they found that untreated depression in patients with MS can significantly worsen their condition. They argued that most patients with MS do not have a rich history of depression and are rarely diagnosed with depression; they believed that depression in these patients can be especially responsive to treatment. Beck (2005) reported that cognitive-behavioral therapy (CBT) and Sertraline were more effective in treating patients with MS and depression than support group therapy.

Ever since Beck developed CBT for depression, it has been the best research-based therapy for every psychological disorder (Beck, 2005). Many research studies and meta-analyses have shown the effectiveness of CBT in treating low, moderate, and severe depression. Therefore, CBT is more effective in treating depression than pharmacological therapies or any other form of psychological intervention (such as interpersonal or support therapy) (Dobson, 1989). Another advantage of CBT is that it may yield more permanent results than pharmacotherapy, and can protect the individual against relapse (Hollon, Jarrett, Nierenberg, Thase, Trivedi, & Rush, 2005).

CBT for depression is a therapy that helps the patient to alter the beliefs and behaviors arising in specific mood states. Cognitive-behavioral therapeutic strategies are implemented in the three stages of focusing on suicidal ideation and depressive cognitive styles, focusing on the way the person connects with other people, and focusing on the behavioral changes necessary to enable the person to cope with problematic situations (Leahy, 2003). One of the advantages of CBT is that, in this therapy, the patient can actively participate in the therapy process and benefit from a process called cognitive restructuring that involves the identification of distorted beliefs and negative thoughts and the search for alternative thoughts that are more reflective of reality, finding negative evidence and replacing thoughts, and generating acceptable and accurate thoughts in relation to specific situations (Beck, 1995). CBT is based on the power of realistic thoughts, i.e., the person's awareness of reality (Leahy, 2003).

Behavioral strategies used in CBT are obtained from Lewinsohn's psychological model (Lewinsohn, 1975). These strategies are customized to meet the specific needs of each patient, and are used as a method of interacting with the patient, reducing their symptoms, and gaining information about the therapy. The primary strategy that involves activity planning and monitoring can be very useful in working with depressed patients. Activity planning can be used by clinicians or patients to plan flexible activities (in order to modify distortion in the patient's thinking about spending time and evaluation of activities related to control and pleasure), planning for enjoyable and constructive activities (especially for those patients who do not allow themselves to participate in these kinds of activities), and identifying activities related to very positive and very negative feelings. This technique provides the patient and clinician with useful information about the patient's functioning. Activity planning enables patients to manage their time and recognize the value of efforts in carrying out activities and earning valuable achievements (Beck, 1979). In CBT, lack of abilities is considered as a contributing factor to depression. For example, an individual, who is not able to manage interpersonal relationships, loses an important opportunity to gain positive reinforcement. Reduced activity is common in depressed patients, and they often conclude that there is no solution for this problem. Through learning how to change their behaviors in the therapy

sessions, they can find direct evidence showing that their cognitive appraisal is not correct. They can then observe strong examples of how error in thinking can lead to maladaptive emotional and behavioral responses, and their problems are resolved using cognitive and behavioral tools (Dennison & Moss-Morris, 2010).

Voss, et al (2002) showed the significant effect of CBT in reducing depression and anxiety in patients with MS. Thomas, etal (2006) also found CBT to be an effective therapy for depression in patients with MS (Thomas, Thomas, Hillier, Galvin, & Baker, 2006). Another approach to treating depression is acceptance and commitment therapy (ACT). It is a modern CBT approach that operates by increasing one's ability to stay active and act according to personal values in order to improve one's functioning and QOL (Walker & Gonzalez, 2007). This approach includes mindfulness and acceptance trainings. Overall, ACT seems to yield promising results; however, more research studies are needed to compare ACT with other evidence-based therapies (Cooper et al., 2011; Liberati et al., 2009). ACT aims to increase the psychological acceptance of subjective experiences (thoughts and feelings), decrease ineffective efforts to control them, and improve awareness of the present-moment (Booth et al., 2012). ACT is, in fact, a third wave psychotherapy that uses metaphors, empirical trainings (such as acceptance and mindfulness, values clarification, and cognitive fusion), and traditional behavioral trainings that promote balance between acceptance and value-based behavior modification strategies (Walker & Gonzalez, 2007). ACT has been designed to help individuals eliminate unnecessary struggling, accept themselves and others as they are, choose valuable life paths, and commit to actions that lead to these paths (Kurtzke, 1983).

As part of ACT, the patient learns to see thoughts (e.g., thinking about suicide) and emotions (e.g., sadness or suffering) as dynamic events that are not, in and of themselves, problematic, and realize that it is their own reaction to these events that creates problems (Sharrack & Hughes, 1999). According to this model, excessive efforts to control painful thoughts and emotions may paradoxically increase the patients' problems. This excessive control may lead to negative outcomes through avoidant behavior. ACT teaches the patients how to experience experiential acceptance instead of focusing on thoughts and emotions. Acceptance has the potential to destroy depressive and ruminative processes (Schulz, Chalmers, Hayes, & Altman, 1995). It can also decrease the problematic suppression of negative thoughts (e.g., avoidance) (Higgins & Green, 2011) through encouraging the patient to observe these experiences while acting based on personal values and choosing life-promoting options.

Confirming the important role of mindfulness and acceptance in ACT, research has shown that higher mindfulness scores are related to decreased depression (Dwan, Gamble, Kolamunnage-Dona, Mohammed, Powell, & Williamson, 2010; Hobart, Riazi, Lamping, Fitzpatrick, & Thompson, 2004). In addition, increased experiential acceptance is associated with reduced suicidal ideation (Cohen, 2013). ACT may be effective in many psychological problems comorbid with MS and other chronic disorders (DerSimonian & Laird, 1986). Ataeimoghanloo et al. found ACT to be effective in treating depression, improving mental health, and reducing the feelings of guilt in 7-15-year-old children with diabetes (Higgins, Thompson, Deeks, & Altman, 2003). An uncontrolled study has shown promising evidence of the efficacy of ACT for patients with MS; it was found that ACT had positive effects on the emotional distress and QOL of these patients (Altman & Bland, 2003). Forman & Lincoln (2010) also found that an increase in experiential acceptance and mindfulness over time was accompanied by decreased depression and suicidal ideation, and increased experiential acceptance in veterans (Forman & Lincoln, 2010).

As previously mentioned, research evidence indicates the efficacy of CBT and ACT in treating depression in patients with MS. Few studies in Iran have specifically focused on the efficacy of these two treatment approaches in treating depression in patients with MS. In addition, no study has investigated the impact of these two therapies generally in treating depression and specifically in patients with MS. Therefore, given the importance of studying depression as a debilitating problem for patients with MS, the present study aimed to investigate the role of two treatment methods, i.e., CBT and ACT, in treating depression in patients with MS. The study hypothesis was that CBT and ACT are effective in reducing depression in these patients. Moreover, the main question of the present study was whether there is a significant difference between CBT and ACT in reducing depression in patients with MS?

Methods

The present study was a clinical trial with control group. The study sample included 45 women with MS and depression symptoms who were members of the Iran MS Society in Tehran, Iran. The participants were selected based on the inclusion and exclusion criteria, using convenience sampling method, and randomly divided into 3 groups (2 intervention groups and 1 control group). The inclusion criteria were suffering from depression based on the cut-off point of the Beck Depression Inventory (BDI), having no other acute or chronic disorder, not using psychiatric drugs during the course of the study, having at least high school education, being 30-50 years of age, and having a history of 5-10 years of suffering from MS. In the next step, a total of 45 patients were randomly divided into 3 groups of 15 individuals (CBT, ACT, and control groups). Before starting the study process, participants provided their written informed consents for participation in the study. During 8 sessions lasting 45 minutes, the first

intervention group received CBT and the second intervention group received ACT. The control group received no intervention, but according to ethical considerations they were provided with 3 consultation sessions.

Cognitive-behavioral therapy sessions

Session 1: Greetings, explaining the main rules, group members getting to know each other, elaborating the mediatory emotions and thoughts between emotions and emotion-eliciting events, and writing them down in three columns

Session 2: Introducing automatic thoughts and cognitive distortions and how to deal with them

Session 3: Training on the outcomes of automatic thoughts, and identifying schemas using the downward arrow technique

Session 4: Reviewing the downward arrow technique and prioritizing beliefs based on the severity of emotions related to each belief

Session 5: Testing beliefs, training on objective analysis, consistency analysis, and criterion analysis of the session

Session 6: Training on logical analysis useful in challenging beliefs by creating several hierarchies of the situations related to the main beliefs, and generating counterstatements for personal beliefs

Session 7: Examination of two content domains of perceptual change (ability to consider a set of information in ambiguous forms, in different ways; understanding that this perceptual change is, in part, an intentional act and a result of justifying the details of information, and learning how to generate the components of perceptual change) and cortical, intentional inhibition

Session 8: Examination of the plans that participants have to preserve what they have achieved during the therapy, receiving feedback from participants about the therapy process, and ending the therapy through a social event

ACT sessions

Session 1: Greetings, explaining the main rules, getting to know each other, getting

familiar with ACT concepts (acceptance, mindfulness, cognitive fusion, values clarification, and committed action)

Session 2: Undermining previous maladaptive strategies using comparisons, metaphors, and examples, showing the inefficacy of avoidance and excessive control of subjective experiences, and creating creative hopelessness

Session 3: Improving participants' ability to accept thoughts and feelings

Session 4: Mindfulness training (improving participants' awareness of their mental states in the present moment)

Session 5: Training on cognitive fusion and its related techniques (improving participants' ability to separate themselves from subjective experiences and act independently of these experiences)

Session 6: Reducing participants' excessive focus on self-image

Session 7: Introducing the concept of value, identifying participants' main life values, and training on how to act according to them

Session 8: Training on committed action (purposeful activity that is based on specified values)

The BDI was used to collect data. The BDI has 21 items that are rated on a 4-point Likert-type scale ranging from 0 (not present) to 3 (severe). In terms of total scores, 0–9 indicate normal mood, 11-16 indicate mild depression, 17-20 indicate in need of consultation, 21-39 indicate toward depression, and 31-40 indicate severe depression. The BDI has good validity in the Iranian population, and its scores are reliable for statistical and psychometric analysis (a = 0.873, r = 0.93) (Lincoln et al., 2011).

The study data were analyzed using descriptive (means, standard deviations, and percentage frequencies) and inferential (multivariate analysis of covariance) statistics. All analyses were performed using SPSS software (version 20, IBM Corporation, Armonk, NY, USA).

Results

Table 1 shows the means and standard deviations of depression scores at pretest and posttest for each study group. As can be seen in this table, the experimental groups had lower depression scores at posttest, but the pretest/posttest depression scores did not differ in the control group.

Table 1. Means and standard deviations of depression at pretest and posttest (N = 45)

Testing stages	Group	Mean ± SD
Depression pretest	CBT	40.46 ± 6.13
	ACT	40.46 ± 6.13
	Control	39.66 ± 5.84
Depression posttest	CBT	32.80 ± 6.87
	ACT	36.00 ± 6.16
	Control	39.86 ± 5.77

CBT: Cognitive-behavioral therapy; ACT: Acceptance and commitment therapy; SD: Standard deviations

Analysis of covariance (ANCOVA) was used to examine the study data. Before conducting this analysis, the assumptions of normal distribution, homogeneity of regression slopes, and equality of error variances were examined and confirmed. Table 2 shows the results of ANCOVA.

Given the significance of F-value (F = 32.1), it can be said that the posttest scores, adjusted for pretest scores, significantly differed between the three groups.

Table 2. Results of repeated measures analysis of covariance (ANCOVA)

Source	Sum of squares	df	Mean square	F	P-value	Effect size
Pretest	1395.51	1	4.732	214.9	0.001	0.840
Groups	416.95	2	1395.510	32.1	0.001	0.610
Error	266.23	41	208.470			
Total	60841.00	45	6.490			

df: Degrees of freedom

Table 3. Scheffe's Test results for comparing mean depression scores between the three study groups

Groups		Mean ± SD	P-value	95% confidence interval	
				Lower bound	Upper bound
CBT	ACT	-3.200 ± 0.930	0.001	-5.08	-1.32
	Control	-7.430 ± 0.931	0.001	-9.32	-5.55
ACT	CBT	3.200 ± 0.930	0.001	-6.12	5.07
	Control	-4.230 ± 0.931	0.001	-6.12	-2.35
Control	CBT	7.430 ± 0.931	0.001	5.55	9.32
	Control	4.230 ± 0.931	0.001	2.35	6.12

Dependent variable: Depression posttest score
CBT: Cognitive-behavioral therapy; ACT: Acceptance and commitment therapy; SD: Standard deviations

The average treatment effect was found to be 61. It was found to be 84 without controlling for the pretest scores. In fact, only 23% of the treatment effect could be explained by the pretesting effect, and this random effect was controlled by ANCOVA.

Scheffe's Test results (Table 3) showed the efficacy of CBT and ACT. In other words, the experimental groups had lower depression scores than the control group, and the mean differences were significant at the 0.05 level. As can be seen in table 3, there was a significant difference between CBT and ACT, and CBT was more effective than ACT in reducing depression in patients with MS ($P < 0.05$). There was also a significant difference between CBT and no treatment, and this indicated the efficacy of CBT. ACT was also significantly different from no treatment ($P < 0.05$), and this showed the efficacy of ACT.

Discussion

The goal of the present study was to compare the efficacy of CBT and ACT in reducing depression in women with MS.

The study results indicated the efficacy of CBT in reducing depression in women with MS. This finding is consistent with those of Mohr et al. (2001), Voss et al. (2002), and Thomas et al. (2006) regarding the effectiveness of CBT in reducing depression in patients with MS.

The study findings also indicated the efficacy of ACT in reducing depression in women with MS. This finding is in line with those of DerSimonian & Laird (1986), Higgins et al. (2003), and Forman & Lincoln (2010) regarding the efficacy of ACT in reducing depression, emotional distress, and other psychological problems, and improving mental health and QOL of patients with MS. This finding is also consistent with that of Forman & Lincoln (2010) who found that ACT was effective in reducing depression and suicidal ideation in veterans.

The final finding of the study indicated that CBT was more effective than ACT in reducing depression in patients with MS. No previous study was found that compared these two therapies in patients with MS; however, this finding is in line with the findings of Mohr et al. (2001). They concluded that CBT was more effective than other psychotherapies, such as support group therapy, in reducing depression in patients with MS. The finding that CBT was more effective than ACT in treating depression in patients with MS could be explained by the fact that CBT is more focused on thoughts and cognitive distortions that can trigger depression, but ACT often emphasizes the individual's reactions and the strategies used to deal with these thoughts. Perhaps focusing on maladaptive thoughts is more effective than focusing on maladaptive strategies. More accurate understanding of the role of CBT and ACT in reducing depression in patients with MS requires further investigation.

The present study had some limitations. First, only patients from Iran MS Society participated in the study. Therefore, caution should be taken in generalizing the results to

other populations. Second, possible intervening variables were not controlled, such as individual differences and psychological aspects of the participants in response to the interventions, impact of environmental and cultural factors on participants' understanding of the therapies, and family problems affecting participants' severity of depression and efficacy of the therapies.

MS is a debilitating disorder; therefore, patients with MS are at higher risk for developing depression, and in times of stress, MS can have more debilitating effects. Therefore, we suggest that mental health professionals and MS-related organizations and centers pay special attention to depression in patients with MS, because depression accelerates the destructive effects of MS and hampers the patent's ability to adaptively cope with these effects. Thus, it is important and necessary to use CBT and ACT as useful methods in reducing depression in patients with MS. We also suggest that other researchers conduct more research studies aimed at comparing different therapies in treating depression in patients with MS, so that the best treatment approach for this purpose can be identified.

Conflict of Interests

Authors have no conflict of interests.

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References

Abramovitz, M. (2004). *Family Medical Guide, MS*. Trans. Hemmatkhah F. Tehran, Iran: Asr-e Ketab.

Altman, D. G., & Bland, J. M. (2003). Interaction revisited: the difference between two estimates. *BMJ., 326*(7382), 219. Retrieved from PM:12543843

Arnett, P. A., Higginson, C. I., Voss, W. D., Randolph, J. J., & Grandey, A. A. (2002). Relationship between coping, cognitive dysfunction and depression in multiple sclerosis. *Clin.Neuropsychol., 16*(3), 341-355. doi:10.1076/clin.16.3.341.13852 [doi]. Retrieved from PM:12607147

Beck, A. T. (1979). *Cognitive Therapy of*

Depression. Guilford clinical psychology and psychotherapy series. New York, NY: Guilford Publications.

Beck, A. T. (2005). The current state of cognitive therapy: a 40-year retrospective. *Arch.Gen.Psychiatry., 62*(9), 953-959. doi:62/9/953 [pii];10.1001/archpsyc.62.9.953 [doi]. Retrieved from PM:16143727

Beck, J. S. (1995). *Cognitive Therapy: Basics and Beyond*. New York, NY: Guilford Publications.

Booth, A., Clarke, M., Dooley, G., Ghersi, D., Moher, D., Petticrew, M. et al. (2012). The nuts and bolts of PROSPERO: an international prospective register of systematic reviews. *Syst Rev., 1*, 2. doi:2046-4053-1-2 [pii];10.1186/2046-4053-1-2 [doi]. Retrieved from PM:22587842

Chwastiak, L. A., & Ehde, D. M. (2007). Psychiatric issues in multiple sclerosis. *Psychiatr.Clin.North Am., 30*(4), 803-817. doi:S0193-953X(07)00074-3 [pii];10.1016/j.psc.2007.07.003 [doi]. Retrieved from PM:17938046

Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum; 1988.

Cooper, C. L., Hind, D., Parry, G. D., Isaac, C. L., Dimairo, M., O'Cathain, A. et al. (2011). Computerised cognitive behavioural therapy for the treatment of depression in people with multiple sclerosis: external pilot trial. *Trials., 12*, 259. doi:1745-6215-12-259 [pii];10.1186/1745-6215-12-259 [doi]. Retrieved from PM:22168507

Dehghan, A., & Memarian, R. (2013). Abundance of stress, anxiety and depression in multiple sclerosis patients. *Alborz Unversity Medical Journal, 2*(2), 82-88.

Dennison, L., & Moss-Morris, R. (2010). Cognitive-behavioral therapy: what benefits can it offer people with multiple sclerosis? *Expert.Rev.Neurother., 10*(9), 1383-1390. doi:10.1586/ern.10.111 [doi]. Retrieved from PM:20819010

DerSimonian, R., & Laird, N. (1986). Meta-analysis in clinical trials. *Control Clin.Trials., 7*(3), 177-188. doi:0197-2456(86)90046-2 [pii]. Retrieved from PM:3802833

Dobson, K. S. (1989). A meta-analysis of the efficacy of cognitive therapy for depression. *J Consult.Clin.Psychol., 57*(3), 414-419. Retrieved from PM:2738214

Dwan, K., Gamble, C., Kolamunnage-Dona, R., Mohammed, S., Powell, C., & Williamson, P. R. (2010). Assessing the potential for outcome reporting bias in a review: a tutorial. *Trials., 11*, 52. doi:1745-6215-11-52 [pii];10.1186/1745-6215-11-52 [doi]. Retrieved from PM:20462436

Forman, A. C., & Lincoln, N. B. (2010). Evaluation of an adjustment group for people with multiple sclerosis: a pilot randomized controlled trial. *Clin.Rehabil., 24*(3), 211-221. doi:0269215509343492 [pii];10.1177/0269215509343492 [doi]. Retrieved

from PM:20026575

Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ., 327*(7414), 557-560. doi:10.1136/bmj.327.7414.557 [doi];327/7414/557 [pii]. Retrieved from PM:12958120

Higgins, J. P. T. , Green S. (2011). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. London, UK: The Cochrane Collaboration.

Hobart, J. C., Riazi, A., Lamping, D. L., Fitzpatrick, R., & Thompson, A. J. (2004). Improving the evaluation of therapeutic interventions in multiple sclerosis: development of a patient-based measure of outcome. *Health Technol.Assess., 8*(9), iii, 1-iii,48. doi:95-01-03 [pii]. Retrieved from PM:14982653

Hollon, S. D., Jarrett, R. B., Nierenberg, A. A., Thase, M. E., Trivedi, M., & Rush, A. J. (2005). Psychotherapy and medication in the treatment of adult and geriatric depression: which monotherapy or combined treatment? *J Clin.Psychiatry., 66*(4), 455-468. Retrieved from PM:15816788

Kurtzke, J. F. (1983). Rating neurologic impairment in multiple sclerosis: an expanded disability status scale (EDSS). *Neurology., 33*(11), 1444-1452. Retrieved from PM:6685237

Leahy, R. L. (2003). *Cognitive therapy techniques: a practitioner's guide*. New York, NY: Guilford Press.

Leonavicius, R., & Adomaitiene, V. (2012). Impact of depression on multiple sclerosis patients. *Central European Journal of Medicine, 7*(5), 685-690.

Lewinsohn, P. M. (1975). The Behavioral Study and Treatment of Depression. In M. Hersen, R. M. Eisler, & P. M. Miller (Eds.), *Progress in Behavior Modification Progress in Behavior Modification* (1 ed., pp. 19-64). Philadelphia, PA: Elsevier.

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gotzsche, P. C., Ioannidis, J. P. et al. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ., 339*, b2700. Retrieved from PM:19622552

Lincoln, N. B., Yuill, F., Holmes, J., Drummond, A. E., Constantinescu, C. S., Armstrong, S. et al. (2011). Evaluation of an adjustment group for people with multiple sclerosis and low mood: a randomized controlled trial. *Mult.Scler., 17*(10), 1250-1257. doi:1352458511408753 [pii];10.1177/1352458511408753 [doi]. Retrieved from PM:21613332

Mohr, D. C., Boudewyn, A. C., Goodkin, D. E., Bostrom, A., & Epstein, L. (2001). Comparative outcomes for individual cognitive-behavior therapy, supportive-expressive group psychotherapy, and sertraline for the treatment of depression in multiple sclerosis. *J Consult.Clin.Psychol., 69*(6), 942-949. Retrieved from PM:11777121

Mokhtari, S. (2004). *Investigate the effectiveness of cognitive behavioral therapy on depression in patients with licensed [MSc Thesis]*. Isfahan, Iran: University of Isfahan.

Mokhtari, S., Neshat Doost, T., & Molavi, H. (2008). The Effect of Cognitive-Behavior Group Therapy on Depression and Dogmatization of Patients with Multiple Sclerosis (M.S.). *Journal of Psychology, 12*(3), 242-251.

Moore, P., Hirst, C., Harding, K. E., Clarkson, H., Pickersgill, T. P., & Robertson, N. P. (2012). Multiple sclerosis relapses and depression. *J Psychosom.Res, 73*(4), 272-276. doi:S0022-3999(12)00209-7 [pii];10.1016/j.jpsychores.2012.08.004 [doi]. Retrieved from PM:22980532

Omrani, S., Mirzaeian, B., Aghabagheri, H., Hassanzadeh, R., & Abedini, M. (2012). Investigating Effectuality of Cognitive-Behavioral Therapy (CBT) as Group Method on the basis of Hope Rate in Patients Suffering from Multiple Sclerosis (M.S). *J Mazandaran Univ Med Sci, 22*(93), 58-65.

Patten, S. B., & Metz, L. M. (2002). Hopelessness ratings in relapsing-remitting and secondary progressive multiple sclerosis. *Int.J Psychiatry.Med, 32*(2), 155-165. doi:10.2190/2G2N-WE19-NM47-JNY8 [doi]. Retrieved from PM:12269596

Patten, S. B., Beck, C. A., Williams, J. V., Barbui, C., & Metz, L. M. (2003). Major depression in multiple sclerosis: a population-based perspective. *Neurology., 61*(11), 1524-1527. Retrieved from PM:14663036

Pittion-Vouyovitch, S., Debouverie, M., Guillemin, F., Vandenberghe, N., Anxionnat, R., & Vespignani, H. (2006). Fatigue in multiple sclerosis is related to disability, depression and quality of life. *J Neurol Sci, 243*(1-2), 39-45. doi:S0022-510X(05)00438-7 [pii];10.1016/j.jns.2005.11.025 [doi]. Retrieved from PM:16434057

Sanchez Lopez, M. P., Olivares, P. T., Nieto, B. A., Hernandez Perez, M. A., & Barroso, R. J. (2004). [Multiple sclerosis and depression]. *Rev.Neurol, 38*(6), 524-529. doi:rn2003543 [pii]. Retrieved from PM:15054715

Schulz, K. F., Chalmers, I., Hayes, R. J., & Altman, D. G. (1995). Empirical evidence of bias. Dimensions of methodological quality associated with estimates of treatment effects in controlled trials. *JAMA., 273*(5), 408-412. Retrieved from PM:7823387

Sharrack, B., & Hughes, R. A. (1999). The Guy's Neurological Disability Scale (GNDS): a new disability measure for multiple sclerosis. *Mult.Scler., 5*(4), 223-233. doi:10.1177/135245859900500406 [doi]. Retrieved from PM:10467380

Thomas, P. W., Thomas, S., Hillier, C., Galvin, K., & Baker, R. (2006). Psychological interventions for multiple sclerosis. *Cochrane.Database.Syst Rev.,*(1), CD004431. doi:10.1002/14651858.CD004431.pub2 [doi]. Retrieved from PM:16437487

van der Werf, S. P., Evers, A., Jongen, P. J., & Bleijenberg, G. (2003). The role of helplessness as mediator between neurological disability, emotional instability, experienced fatigue and depression in patients with multiple sclerosis. *Mult.Scler., 9*(1), 89-94. doi:10.1191/1352458503ms854oa [doi]. Retrieved from PM:12617274

Voss, W. D., Arnett, P. A., Higginson, C. I., Randolph, J. J., Campos, M. D., & Dyck, D. G. (2002). Contributing factors to depressed mood in Multiple Sclerosis. *Arch.Clin.Neuropsychol., 17*(2), 103-115. doi:S0887617700000949 [pii]. Retrieved from PM:14589740

Walker, I. D., & Gonzalez, E. W. (2007). Review of intervention studies on depression in persons with multiple sclerosis. *Issues Ment.Health Nurs., 28*(5), 511-531. doi:779877956 [pii];10.1080/01612840701 344480 [doi]. Retrieved from PM:17613150

Wallin, M. T., Wilken, J. A., Turner, A. P., Williams, R. M., & Kane, R. (2006). Depression and multiple sclerosis: Review of a lethal combination. *J Rehabil.Res Dev, 43*(1), 45-62. Retrieved from PM:16847771

Wineman, N. M., Schwetz, K. M., .Zeller, R., & Cyphert, J. (2003). Longitudinal analysis of illness uncertainty, coping, hopefulness, and mood during participation in a clinical drug trial. *J Neurosci Nurs*, 35(2), 100-106

Ziemssen, T. (2009). Multiple sclerosis beyond EDSS: depression and fatigue. *J Neurol Sci, 277*(Suppl 1), S37-S41. doi:S0022-510X(09)70011-5 [pii];10.101 6/S0022-510X(09)70011-5 [doi]. Retrieved from PM:19200865

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