Original Article

Effectiveness of psychological training combined with gradual muscular stress relaxation technique on quality of life of patients with multiple sclerosis

Vazirinejad R,PhD[1], Jafarzadeh A, PhD[2], Yassini SM, MD[3], Rahimdel A, MD [4], Sayadi AR, MSc [5*]

1- Professor, Dept. of Social Medicine, Social Determinants of Health Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran. 2- Professor, Dept. of Immunology, Cellular and Molecular Biology Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran. 3- Associate prof., Reseach Center of Addiction and Behavioural Scences, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. 4- Associate Prof., Dept. of Neurology, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. 5- PhD Student of Research, Social Determinants of Health Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.

Abstract

Received: June 2016, **Accepted**: September 2016

Background: Multiple sclerosis (MS) is one of the most common chronic diseases of the central nervous system. The aim of this study was to determine the effectiveness of psychological training combined with gradual muscular stress relaxation technique on QOL of patients with MS.

Materials and Methods: This triple-blind, controlled, clinical trial was conducted on 60 patients with MS who were members of the Multiple Sclerosis Society of Yazd Province, Iran. The subjects were selected through convenience sampling method and with the consideration of the inclusion criteria. The participants were randomly divided into 2 groups of experimental (30 persons) and control (30 persons). The experimental group received 12 sessions of psychological training combined with gradual muscular stress relaxation technique (2 sessions per week), but the control group received no intervention. The data collection tools used consisted of a demographic characteristics form and the Multiple Sclerosis Quality of Life-54 (MSQOL-54) questionnaire. The questionnaires were completed before, immediately after, and 3 months after the training. Data were analyzed using the statistical tests of student's t-test, Pearson correlation, and repeated measures.

Results: QOL score in the experimental and control groups were 50.86 ± 14.78 and 56.25 ± 13.09 before the intervention (p=0.141), 68.49 ± 11.81 and 55.76 ± 13.37 immediately after the intervention, and 67.80 ± 11.90 and 55.06 ± 12.83 three months after the intervention, respectively. This difference was statistically significant (P <0.0010). Moreover, repeated measures statistical test showed a meaningful increase in QOL score in the experimental group in the 3 measurements (P < 0.0001).

Conclusions: The implementation of psychological training intervention combined with gradual muscular stress relaxation method in patients with MS increases QOL. Therefore, it can be used as a beneficial intervention method for improving the QOL of patients with MS.

Keywords: Multiple Sclerosis, Training, Psychological, Relaxation, Quality of Life

Introduction

Multiple sclerosis (MS) is an autoimmune, inflammatory, chronic, and progressive disease which occurs in the form of neural damages or damaged myelin in the white matter of the brain, spinal cord, and optic nerves (1-5).

MS is one of the most important central nervous system diseases, one of the most common neurologic diseases in humans, and the most common illness leading to inability in young people (6).

In south west Asian countries, the incidence of this disease is approximately 51.52 in 100,000 persons (7). The main cause of this disease is

* **Corresponding author:** Ahmad Reza Sayadi, Social Determinants of Health Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.
E-mail: sayadiahmad@yahoo.com

not yet known, but genetic and environmental factors have a role in its occurrence (8, 9).

Iran is among the countries with high MS incidence rate, which ranges from 5.30 to 74.28 per 100,000 persons, and the reason for this is still unknown (10). Although the prevalence of MS is high in the age group of 20 to 40 years, the symptoms of this disease may also be observed in childhood and middle age (11). The prevalence of MS in women is higher compared to men due to hormonal and immune system-related factors. The ratio of MS incidence among women to men has been reported as 2 to 1 in some sources (12), and 4 to 1 or 3 to 1 in other sources (13). Quality of life (QOL) is a multidimensional concept the meaning of which stems from the beliefs and ideas of the individual, and thus, it must be evaluated through the perceptions of patients (14). This concept includes physical health, psychological states, independence, social relationship, and personal and religious beliefs (15), and is comprises different constructs such as social, physical, psychological performance, overall health perception, and social opportunities (16).

The QOL of patients is considered as an index for the quality of healthcare and part of disease control programs; therefore, measuring the physical health of these patients alone is not enough. QOL includes notions beyond physical health, and it is necessary to measure QOL as an important consequence separately (17).

Chronic diseases such as MS decrease the QOL of patients (18, 19). Today, governments and health systems all over the word pay attention to improving patients' QOL, increasing physical, mental, and social welfare of individuals and the society through health and treatment services and modern treatment methods, and decreasing consequences of illnesses (19, 20).

The effect of psychological intervention on the improvement process of chronic physical illnesses has been confirmed (19). Due to the expansion of the health psychology field, psychologists have a more active role in the treatment process of patients (21). Most mental-social interventions are based on the traditional approach of medicine which is designed for treatment, damage, illness, disability, and malfunction. Psychological training interventions show a paradigm change which follow a comprehensive approach based on competence, focus on health, participation, management, and rehabilitation (22). The provision of suitable medical and psychological information in psychological training interventions can improve patients' satisfaction and decrease their psychological symptoms (23).

Another investigation showed correlation between physical fatigue and physical disability, and psychological fatigue and depression in these patients; physical fatigue is a predictor of physical disability during a 1-year time period (24). More than 90% of patients with MS experience fatigue, and 50% to 60% report this problem as the worst symptom of the disease which has a severe impact on their daily activities and performance, and QOL (25). Sa performed a review study on the psychological aspects of MS (26). Sa concluded that treatment methods such as psychotherapy, cognitive behavioral therapy (CBT), increasing confrontational behavior, self-control therapy, and drug therapy are effective on the improvement of psychological status and QOL (26). Many psychological factors have a role in the QOL of patients with MS; therefore, damages and physical disabilities should not be the sole focus of researches. New intervention studies should be designed which consider the QOL and health of these patients (27). Most scientific and research investigations on behavior interventions have been focused on psychological-social actions including QOL, fatigue, or depression. However, it can be clearly stated that part of the biological processes such as inflammation, endocrine-nerve disorders, or brain damage are among the neural-psychological symptoms of MS (28).

Therefore, psychological intervention methods can have a distinct role in this respect. Although national and foreign researches have been conducted in this regard, the researchers did not find a study which investigated the effectiveness of psychological training intervention combined with gradual muscular stress relaxation technique on the QOL of patients with MS. Therefore, the goal of the present study was the determination of the effectiveness of psychological training intervention combined with gradual muscular stress relaxation technique on the QOL of patients with MS.

Materials and Methods

The present study was a triple-blind, controlled, clinical trial. The target population consisted of patients with MS. The statistical population consisted of all patients with MS who were members of the Multiple Sclerosis Society of Yazd Province, Iran, located in the Baghaipour Speciality and Super Speciality Polyclinic in Shahid Sadoughi Hospital in the year 2015.

The statistical sample, based on methods of sample size determination, included 60 patients with MS who were members of the Multiple Sclerosis Society of Yazd Province. The subjects were randomly divided into two groups of experimental (30 persons) and control (30 persons) with the consideration of the inclusion and exclusion criteria. A permit was obtained from the authorities, and written consent forms were obtained from the subjects after sufficiently explaining the goals and methods of the research, then, they were invited to participate in the study. The inclusion criteria included lack of another physical disease, lack of any mental and psychological diseases, lack of reaching the acute phase of the disease, at least one year history of affliction with MS, lack of use of corticosteroid for 2 months prior to and during the study, lack of pregnancy in women, lack of history of cigarette, alcohol, and drug addiction, age of 20-40 years, education level of at least middle school, lack of use of ecstasy drugs and cognitive treatments during the study, lack of participation in yoga and relaxation classes, special sport activities, and lifestyle and adjustment techniques in the past 6 months, lack of hearing and speaking problems, undergoing treatment and lack of modification of medication during the study, of Expanded Disability Status Scale (EDSS) score of 0.5-4, and Iranian nationality. The exclusion criteria included lack of regular participation in educational classes, the occurrence of special problems for the patients during the study period, lack of willingness to continue the study, and occurrence of an accident for the patient during the last 6 months.

The study process is summarized in the following steps:

A. Before the intervention: After selecting the subjects in accordance to the inclusion and exclusion criteria, they were randomly divided into experimental (30 persons) and control (30 persons) groups. First, psychology and neurology specialists interviewed and examined the patients. Then, both groups filled a demographic characteristics questionnaire and the Multiple Sclerosis Quality of Life-54 (MSQOL-54). The validity and reliability of the Persian version of the MSQOL-54 has been approved in Iran (29). This questionnaire includes 54 questions which are scored on 2-point to 7-point Likert scales. The QOL score is determined based on the scores for the two combinatory fields of physical health and mental health. Scores of the 14 fields and the two combinatory fields range from 0 to 100 and higher scores show a better status. Sanglji et al. studied the relationship between disability and QOL in patients with MS in the Multiple Sclerosis Society of Tehran, Iran, using the MSQOL-54 (30). Heidari Soursh Jani et al. also used this questionnaire in their investigation of the QOL of patients with MS in Esfahan, Iran, and confirmed the validity of this tool (r = 0.86) (31). In the present study, the MSQOL-54 was used in order to measure the participants' QOL. These questionnaires

were completed by the subjects during the session before the educational intervention in the abovementioned center after the interviewer provided sufficient explanation.

B. The intervention: The psychological training package which was approved by specialists in the field of psychology and medicine was performed in the experimental group during 12 90-minute sessions (45 minutes speech and 45 minutes group discussion), 2 sessions per week. The gradual muscular stress relaxation technique was performed in the experimental group for 3 months, once per day in the presence of the researcher, and the subjects completed a self-report checklist. The control group received no education in this period and had no knowledge of the education of the experimental group.

C. Immediately after the intervention: In the session after the end of the intervention, the questionnaires were again filled by both groups in the presence of the interviewer, and both groups were interviewed and examined by psychology and neurology specialists.

D. Follow-up step. In the follow-up step 3 months after the intervention, the questionnaires were filled by both groups in the presence of the interviewer and both groups were interviewed and examined again by psychology and neurology specialists. The collected data were coded and entered into the computer, and analyzed in SPSS software (version 17, SPSS Inc., Chicago, IL, USA) using chi-square test, t-test, repeated measure, and the Pearson correlation coefficient. Furthermore, based on ethical principles, after 3 months of follow-up and data collection, the 12 educational sessions were held for the control group. Because of the triple-blind nature of the study, the questionnaires were filled in the presence of the interviewer.

Results

In this study, 60 individuals in two groups of experimental (30 person) and control (30 persons) participated. Among the experimental and control group participants, 24 (80%) and 23 (76.7%) were women, 7 (23.3%) and 9 (30%) single, and 18 (60%) and 15 (50%) homemakers, respectively. In the experimental group, 18 (60%) subjects had high school education, and 12 (40%) had university degrees. In the control group, 16 (53.3%) participants had high school education, and 14 (46.7%) had university degrees. In the experimental group, 6 (20%), 19 63.3%, and 5 16.7% individuals had, respectively, good, average, and weak economic status. In the control group, 5 (16.7%), 20 (66.6%), and 5 (16.7%) individuals had good, average, and weak economic status, respectively. Moreover, 2 (6.7%) and 1 (3.3%) subjects in the experimental and control groups, respectively, had a history of MS in the family. The average and standard deviation of age of the subjects was 32.92 ± 6.73. This average was 33.60 ± 6.28 in the experimental group and 32.033 ± 6.403 in the control group (P = 0.343). The age of subjects at the onset of the disease in the experimental group was 27.53 ± 7.04 and in the control group was 25.87 ± 5.76 (P = 0.320). The duration of the disease in experimental group was 6.03 ± 4.16 and in the control group was 6.03 ± 4.21 (P = 0.987). Mean BMI in the experimental and control groups was, respectively, 23.60 ± 3.68 and 24.27 ± 4.33 (P = 0.519). EDSS score in the experimental and control groups was, respectively, 2.35 ± 0.238 and 2.29 ± 0.346 (P = 0.437) (Table 1).

Statistical analysis of demographic and disease data using chi-square test for qualitative variables and student's t-test for quantitative variables showed that the experimental and control groups had no meaningful difference before the intervention (P > 0.050). Furthermore, t-test results showed no statistically significant difference between the two groups in terms of average QOL score before the intervention (P = 0.141). However, this difference between the two groups was significant immediately and 3 months after the intervention (P < 0.0001). The QOL score had greater increase in the experimental group compared to the control group.

Table 1: The demographic characteristics and illness information of the two groups

Demographic and disease information / Frequency of group		Experimental		Control		Total		P-value
		Number	Percent	Number	Percent	Number	Percent	
Gender	**Male**	6	20	7	23.3	13	21.7	P=0.754
	Female	24	80	23	76.7	47	78.3	
Marital status	**Single**	7	23.3	9	30	16	26.7	P=0.771
	Married	23	76.7	21	70	44	36.4	
Education	**High School**	18	60	16	53.3	34	56.7	P=0.602
	University	12	40	14	46.7	26	43.3	
Occupational status	**Unemployed**	3	10	2	6.7	5	8.3	P=0.868 not valid
	Student	3	10	4	13.3	7	11.7	
	Homemaker	18	60	15	50	33	55	
	Employee	3	10	5	16.7	8	13.3	
	Self-employed	3	10	4	13.3	7	11.7	
Economic status	**Good**	6	20	5	16.7	11	18.3	P=0.987
	Average	19	63.3	20	66.6	39	65	
	Weak	5	16.7	5	16.7	10	16.7	
MS history in family	**No**	28	93.3	29	96.7	57	95	P=1
	Yes	2	6.7	1	3.3	3	5	

Statistical indexes	Experimental group (Mean ± SD)	Control group (Mean ± SD)	P-value
Age	33.6 ± 6.284	32.033 ± 6.403	p= 0.343
Age of disease onset	27.533 ± **7.045**	25.867 ± 5.758	p= 0.32
Disease duration	6.033 ± **4.156**	6.033 ± 4.206	p= 0.987
BMI	23.599 ± 3.685	24.272 ± 4.329	p= 0.519
EDSS	2.35 ± 0.238	2.29 ± 0.346	p= 0.437

BMI: Body mass index, EDSS: Expanded disability status scale

In addition, repeated measures results showed a significant difference in the mean QOL score of the experimental group between the three different times ($P < 0.0001$). However, this difference was not significant in the control group ($P = 0.587$) (Table 2).

Table 2: Comparison of mean quality of life score in the experimental and control groups at three different times

Group / Time of investigation	Experimental (Mean ± SD)	Control (Mean ± SD)	t-test
Before the intervention	50.865±14.785	56.251 ±0.961	p=0.141
Immediately after the intervention	68.488±11.81	55.761±13.370	p<0.00001
Three months after the intervention	67.8±11.90	55.0633±12.831	p<0.00001
Results of repeated measures test	p<0/00001	p=0.587	-

Discussion

In this study, statistical comparison of the two groups showed no significant difference between the groups in terms of some variables before the intervention (Table 1); this result shows the randomness of selection of subjects for each group. The results of this study showed that psychological training combined with gradual muscular stress relaxation technique increases the QOL score in the experimental group compared to the control

group. Furthermore, the present study results showed a significant difference in QOL score between the two groups in the three measurements. This meaningful difference indicates the impact of psychological training combined with gradual muscular stress relaxation technique on increasing the QOL score in the experimental group in different times after the intervention. This finding signifies that psychological training intervention is effective on improving QOL of patients with MS which is in agreement with the results of other studies in this field. For example, the results were in agreement with findings of Somrarnyart (32) and Schulman et al. (33). In a controlled clinical trial, Masoudi et al. investigated the effect of family-centered empowerment model on QOL and self-efficacy of 70 family caretakers of patients with MS (34). Independent t-test showed no statistically significant difference in QOL and self-efficacy of control and experimental groups before intervention; however, this difference was significant after the intervention (P = 0.001). Paired t-test results were significant in the experimental group before and 3 months after the intervention (P = 0.001); however, this difference was not significant in the control group (34). Soleimani et al. conducted a controlled clinical trial on the effectiveness of self-control therapy on QOL of patients with MS (20 individuals in the experimental group and 20 individuals in the control group) (35). They found a significant difference in the average score of QOL of patients with MS compared with the control group; the QOL score of patients with MS had increased significantly (35). Sa, in a review study on psychological aspects of MS, reported that treatment methods such as psychotherapy, self-control therapy, and drug therapy are effective on the improvement of psychological status and QOL (26).

There is no doubt that an important psychological problem in this group of patients stems from increased physical and psychological problems which prevent a sense of control over daily conditions of life. Therefore, their medical and rehabilitation programs are disrupted. Generally, psychological interventions provide patients with a better understanding of their status and daily life. This gives patients a sense of peace and causes them to have a more active role in self-management and prevention of disease recurrence. Psychological intervention increases compulsive performance of patients. The psychological interventions in the present study had an effect on compulsive performance through components such as compulsive adjustment, gradual muscular stress relaxation, stress management, problem solving, hope, personal relationships, sport activities suitable for these patients, and etc. The increase in QOL score in the experimental group was due to the patients gaining a better understanding of their thoughts and emotions, more positive beliefs, their strengths, learning logical inference and realistic assessment of events, and positive attention towards life and family during education sessions, and gaining peace through gradual muscular stress relaxation.

Conclusion

The execution of psychological training combined with gradual muscular stress relaxation technique is simple. Thus, this intervention program is recommended as a treatment method for patients with MS to increase their QOL score and have positive effects on their QOL.

Acknowledgement

The Authors acknowledge and appreciate the support of the Research Council of the university, the Research Council of the Social Factors Affecting Health Research Center of Rafsanjan University of Medical Sciences, and the management of Multiple Sclerosis Society of Yazd Province.

Conflict of Interest: None declared

References

1. Strober LB, Arnett PA. An examination of four models predicting fatigue in multiple sclerosis. Arch Clin Neuropsychol 2005; 20(5):631-46.
2. Joffe RT. Depression and multiple sclerosis: a potential way to understand the biology of major depressive illness. J Psychiatry Neurosci 2005; 30(1):9-10
3. McCabe MP. Mood and self-esteem of persons with multiple sclerosis following an exacerbation. J Psychosom Res 2005; 59(3):161-6.
4. Schulz KH, Gold SM, Witte J, Bartsch K, Lang UE, Hellweg R, et al. Impact of aerobic training on immune-endocrine parameters, neurotrophic factors, quality of life and coordinative function in multiple sclerosis. J Neurol Sci 2004; 225(1-2):11-8.
5. Ozakbas S, Cagiran I, Ormeci B, Idiman E. Correlations between multiple sclerosis functional composite, expanded disability status scale and health-related quality of life during and after treatment of relapses in patients with multiple sclerosis. J Neurol Sci 2004; 218(1-2):3-7.
6. Koopman W, Schweitzer A. The journey to multiple sclerosis: a qualitative study. J Neurosci Nurs 1999; 31(1):17-26.
7. Heydarpour P, Khoshkish S, Abtahi S, Moradi-Lakeh M, Sahraian MA. Multiple sclerosis epidemiology in Middle East and North Africa: A systematic review and meta-analysis. Neuroepidemiology 2015; 44(4):232-44.
8. The International Multiple Sclerosis Genetics Consortium (IMSGC), Wellcome Trust Case Control Consortium 2 (WTCCC2), Sawcer S, Hellenthal G, Pirinen M, Spencer ChCA, et al. Genetic risk and a primary role for cell-mediated immune mechanisms in multiple sclerosis. Nature 2011; 476(7359):214-9.
9. Ascherio A. Environmental factors in multiple sclerosis. Expert Rev Neurother 2013; 13(12 Suppl):3-9.
10. Etemadifar M, Sajjadi S, Nasr Z, Firoozeei TS, Abtahi SH, Akbari M, et al. Epidemiology of multiple sclerosis in Iran: a systematic review. Eur Neurol 2013; 70(5-6):356-63.
11. Abi Chahine NH, Rached JR, Abdelkarim AF, Hamade AA, Zoghbi VV. Treatment of long standing multiple sclerosis with regentime stem cell technique. Stem Cell Res Ther 2015; 5:8. doi: 10.4172/2157-7633.1000299.
12. Ropper AH, Brown RH. Adams and Victor's principles of neurology. 8th ed. 2 Pennsylvania Plaza New York, United States: McGraw-Hill Professional; 2005. P.961-75.
13. Koff MD, Cohen JA, McIntyre JJ, Carr CF, Sites BD. Severe brachial plexopathy after an ultrasound-guided single-injection nerve block for total shoulder arthroplasty in a patient with multiple sclerosis. Anesthesiology 2008; 108(2):325-8.
14. Gore-Felton C1, Koopman C, Spiegel D, Vosvick M, Brondino M, Winningham A. Effects of quality of life and coping on depression among adults living with HIV/AIDS. J Health Psychol 2006; 11(5):711-29.
15. Sousa KH, Kwok OM. Putting Wilson and Cleary to the test: analysis of a HRQOL conceptual model using structural equation modeling. Qual Life Res 2006; 15(4):725-37.
16. Patrick DL, Erickson P. Health status and health policy: Quality of life in health care evaluation and resource allocation. 1st ed. Oxford, England: Oxford University Press; 1993.
17. Lechner SC, Antoni MH, Lydston D, LaPerriere A, Ishii M, Devieux J, et al. Cognitive-behavioral interventions improve quality of life in women with AIDS. J Psychosom Res 2003; 54(3):253-61.
18. Beto JA, Bansal VK. Quality of life in treatment of hypertension. A meta-analysis of clinical trials. Am J Hypertens 1994; 5(3):125-33.
19. Deyo RA. The quality of life and research and care. Ann Intern Med 1991; 114(8):695-7.
20. Gu D, Reynolds K, Wu X, Chen J, Duan X, Muntner P, et al. Prevalence, awareness, treatment, and control of hypertension in China. Hypertension 2002; 40(6):920-7.
21. Watson M, Homewood J, Haviland, JS, Bliss JM. Influence of psychological response on breast cancer survival: 10-year follow-up of a population- based cohort. European Journal of Cancer 2005; 41(12):1710-4.
22. Marsh D. Working with families of people with serious mental illness. In: Vande Creek L, Knapp S, Jackson TL, editor. Innovations in clinical practice: A source book. Sarasota, FL: Professional Resource Press; 1992. P.389-402. (Vol. 11).
23. Capozzo MA, Martinis E, Pellis G, Giraldi T. An early structured psychoeducational intervention in patients with breast cancer: results from a feasibility study. Cancer Nurs 2010; 33(3):228-34.
24. Schreurs KM, de Ridder DT, Bensing JM. Fatigue in multiple sclerosis: reciprocal relationships with physical disabilities and depression. J Psychosom Res 2002; 53(3):775-81.

25. Ale-Yasin H, Sarai A, Alaeddini F, Ansarian E, Lotfi J. Multiple sclerosis: A study of 318 Iranian cases. Arch Iran Med 2002; 5(1):24-7.
26. Sá MJ. Psychological aspects of multiple sclerosis. Clinical neurology and neurosurgery 2008; 110(9):868-77.
27. Mitchell AJ, Benito-Leon J, Gonzalez JM, Rivera-Navarro J. Quality of life and its assessment in multiple sclerosis: integrating physical and psychological components of wellbeing. Lancet Neurol 2005; 4(9):556-66.
28. Fischer A, Heesen C, Gold SM. Biological outcome measurements for behavioral interventions in multiple sclerosis. Ther Adv Neurol Disord 2011; 4(4):217-29.
29. Ghaem H, Borhani Haghighi A, Jafari P, Nikseresht AR. Validity and reliability of the Persian version of the multiple sclerosis quality of life questionnaire. Neurol India 2007; 55(4):369-75.
30. Sangelaji B, Salimi Y, Dastoorpour M, Mansouri T, Ashrafinia F, Esmaeilzadeh N, et al. The relationship between disability and quality of life in multiple sclerosis patients. Journal of Health & Development 2013; 2(3):203-13.
31. Heidari Sureshjani S, Eslami AA, Hassanzadeh A. The quality of life among multiple sclerosis patients in Isfahan, Iran. Health System Research 2012; 7(5):571-9.
32. Somrarnyart M. Effectiveness of self-management training program among Thai cancer patients with pain. The Journal of Pain 2007; 8(4): S54.
33. Schulman-Green D, Bradley EH, Knobf MT, Prigerson H, DiGiovanna MP, McCorkle R. Self-management and transitions in women with advanced breast cancer. J Pain Symptom Manage 2011; 42(4): 517-25.
34. Masoodi R, Alhani F, Rabiei L, Majdinasab N, Moghaddasi J, Esmaeili SA, et al. The effect of family-centered empowerment model on quality of life and self efficacy of multiple sclerosis patients family care givers. Iranian Journal of Nursing Research 2013; 7(27):32-54.
35. Soleimani E, Habibi M, Basharpuor S. Effectiveness of self-control training on dimensions of quality of life in multiple sclerosis patients. Journal of Research in Behavioural Sciences 2013; 10(7):746-56.