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The Effectiveness of Music Therapy on Depression, Anxiety and self-esteem of patients with Multiple Sclerosis (MS)

[1]Maryam Zadbagher Seighalani, [2]Shahrbanoo Ghahari, [2]Mohammadreza Zarbakhsh

[1]Department of Psychology, Islamic Azad University, Tonekabon Branch, Tonekabon, Iran
[2]Assistant Professor, Department of Psychology, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran

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ABSTRACT

MS Patients have higher levels of psychological disorders such as depression, anxiety and stress than healthy individuals. With regard to incomplete effectiveness of drug treatment, increasing attention to non-drug methods, music therapy is taken into consideration as non-pharmacological methods of treatment. The aim of this study is to determine effectiveness of music therapy on anxiety,; depression and self-esteem of patients with multiple sclerosis. The research method was experimental and its design was pretest-posttest with control group. Study population was all from MS patients (650 people) that had referred to Tehran MS association at second half of 2012. The sample group was 30 people who randomly selected among MS patients that had high scores of anxiety and depression and low self-esteem scores. Then, we randomly assigned them in experimental and control groups (15 people). For collecting data, depression and anxiety Beck inventories and Cooper Smith self-esteem questionnaire were applied. Experimental group was exposed to 6 sessions of active music therapy (each session 30 minutes) and 9 session of passive music therapy (each session 30 minutes). Then each two groups completed inventories mentioned above. Also, the follow up test was performed on experimental and control group. Finally, data analysis was performed by analysis of variance with repeated measures in SPSS software. The results showed that the mean scores of depression, anxiety and self-esteem of patients with MS in experimental group is significantly different from different from control group in post-test and follow up. Namely, the mean scores of anxiety and depressiondecreased due to the effect of music therapy and self-esteem scores increased because of the effect of music therapy. Therefore music therapy can be used as a no pharmacological therapy and with much less cost thanother therapies in improving symptoms of depression, anxiety and increasing self-esteem ofMS patients.

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INTRODUCTION

Multiple schlorosis is one of the most widespread chronic diseases of central neural system which is accompanied by neuron demyelination. Demyelinated parts will cover all the white corps of mind and affect the kinesthetic functionality [14,28,26]. This disease has affected one out of A thousand people and its incidence is about 1.1 million people all over the word [26]. The most common age for this disease is between the ages 20 to 40 [24,9]. These are the years each person has the highest level of responsibility and fertility [20]. So, this disease will hurt reproductive forces of the society and this harm is for all members of the society [3]. Pre awareness of this disease is not obvious and patients will experience various physical and mental disorders [24].These disorders affect daily routine, social and family life, Functional independence and future planning and generally destroys individual's well-being. About 80 percent of these patients may have some degree of disability and only one out of 5 may have stable situation. So, this disease can cause some symptoms of mental and behavioral disorder such as depression, stress and anxiety caused by protensiveness of disease or lack of definite pre awareness of that. The MS patients are in higher levels of mental disorders such as depression, stress and anxiety than healthy people.. These symptoms may be caused by direct effect of demyelination or mental and unpredicted effect of the chronic MS disease [26,12]. About 84 percent of the patients experience anxiety, stress and depression symptoms within the first year of disease's diagnosis [26]. Studies have shown that about 50 to 60 percent of the patients suffer from depression and about 25 to 40 of them suffer from anxiety [8] which severely affects their life quality. About 50 percent of mental symptoms cannot be diagnosed by routine Neurological process. So based on the above mentioned cases and wide dispersion of stress, depression

Corresponding Author: Maryam ZadbagherSeighalani,Department of Psychology, Islamic Azad University, Tonekabon Branch, Tonekabon, Iran.

and anxiety, it is necessary to apply diagnostic tests and psychological and social treatments to eliminate its effects [26] since common chemical treatments in all MS patients are not effective and have many side effects including tiredness, mental imbalance which do not have Quite effective treatment [18]. Medicines for regulating immune system and steroid therapy are effective in reducing some of MS's symptoms and are widely used for patients. But these medicines cannot be protective enough for development process or make the progression vice versa. In addition, they have various side effects including Increasing spasticity, vomiting, depression, neurotic pains, fever, headache and etc. [19]. So, in recent years non-medical methods have been widely used by MS patients and are known as complementary treatment (39). Complementary treatments are ones with social nature for increasing patients' physical and mental health. Different researches have shown that about one third of the MS patients use complementary treatments. In addition, the acceptance of complementary treatments has increased, too [17].

One of the common methods among complementary treatments is music therapy. The aim of music therapy is for patients to be able to develop their relationship and express their feeling which cannot be verbally expressed [14]. Music therapy plays a role in cognitive, physical and emotional health and empowers mental health through note order. Furthermore, people can use music for treating sadness, guilt and moodiness and it can be utilized for fighting with bad feeling and reducing solitude. On the other hand, participating in music sessions can Provide situations for creating social relationship and making positive changes in physical and mental mood and improving control over life, reduce anxiety and increases self-confidence (Shaufer, 2005; Chwi, 2008). Previous researches have proved the role of music as a treatment instrument and they believe that music therapy acts as an anti-depression. In addition, one can affect his/her mood and depression through choosing a proper type of music. So, using music with slow rhythm can reduce depression, Anger, sadness and anxiety. Following some results are provided. Chu and Lin [7] investigated therapeutic effect of music through 12 sessions of music therapy on elder dementia patients . The results showed that old people's depression had significant reduction after treatment. Also, their cognitive functionalities had improved after sixth session, So that in 12th session and even after a month, their cognitive functionality has increased significantly.

Hernandz, Castro, Molin, Jami and Goardad [18] also showed that music therapy can provide patients' comfort during chemical treatment and control their over anxiety.

Another research by Sookshin and Hee Kim [33] investigated the effect of music therapy on pregnant women's anxiety, stress and dependence to their embryo through TransvaginalSonography. The results showed a significant reduction in anxiety of pregnant women

Also, During a study on effectiveness of listening to music on reduction of depression, Fai chan, Yung Vang and Taila [11] indicated that listening to music during a period of time will remove signs of depression in adult society. Their findings showed that daily intervention seems to be better than weekly ones. So it is better to listen to music in a time period of 3 weeks to have a decisive effect.

In another study, Goutin, Flourtes, Gabl, Tachon and Boutea [16] investigated music therapy on anxiety, depression of Alzheimer patients. Their results indicated positive effect of music therapy on their anxiety and depression after the music therapy interventions. .

In another research by Mahmoodi, Rahgavi, Rahgozar and Zadmohammadi [23], the effect of music therapy on self-esteem of Schizophrenic patients' was investigated and they concluded that Active and Passive music therapy has improved patients'self-esteem.

Gomez perez, Calvillo Velasco, Perez-Compos and Mayoral, investigated the effect of music therapy compared to the psychological therapy on depressed patients. Some of them were under psychotherapy based on behavioral therapy and some others were under music therapy. The results indicated that study group under music therapy showed less signs of depression compared to the group exposed to psychotherapy. They concluded that people with minimum or medium depression level can benefit from music therapy for increasing the effects of psychological support. In a study by Burak [4], on the effect of music therapy on 80-year-old people, the results indicated that music therapy causes more healthy feeling, less recourse to doctor and significant improvement in depression, solitude and their mood.

In another study by Aldrige, Schmid, Kaeder, Schmidt and Ostermann [1], they studied the effect of music therapy on MS patient which showed that it causes decrease in depression, anxiety and tiredness and also increase in self-esteem and self-acceptance of the patients.

Pasha, Bakhtiarpour and Akhavan [34] in a study of effects of music effect on memory and focus of Schizophrenic patients in Dezfolshafa center, showed that teaching active music can be effective on their memory and focus.

With respect to the problems which every MS patients may encounter including anxiety, depression and low self-esteem, this research tries to find some answers for the question that: How effective can be music therapy as a complementary and non-chemical medicine on reducing these signs of depression, anxiety and increasing their self-esteem? In other words, the main question of this research is: Is music therapy effective on depression, anxiety and low self-esteem of MS patients.

Methodology:

Research methodology is experimental and its design is pretest-posttest with control group.

Population, Sample and Sampling Method:

The population of the present research all includes the MS patients recourse Tehran MS center in second six month of the year 1391. They are 650 people. Research sample are 30 MS patients which have been chosen randomly and placed randomly in one experimental group (15 individuals) and one control group (15 individuals). So, 100 patients were chosen from among the population and answered Copper-Smith questionnaire of depression and anxiety and self-esteem. 38 people gained over 20 scores on depression test and over 22 on anxiety tests and less than 25 on self-esteem test. Selection criteria of study included specialist physician's specification of MS disease which was obtained by assessing the medical records and consulting their physicians. In addition, Due to the purpose of research one of main factors for patients to enter the study was gaining a score higher than average in tests of depression (20) and anxiety (22) and also gaining lower than average score on Copper self-esteem test (25). The criteria to exit the study were also to gain a score lower than average in depression and anxiety Beck test and higher than average in Cooper-Smith self-esteem test. Data were analyzed in descriptive and deductive parts. In descriptive part, average and standard deviation were used and in deductive part variance analysis test with repetitive measures were used.

Instruments:

Beck depression test: it is one of the most common and reliable psychological tests. This tests is applicable for various people and social environments and does not dependent on culture. Beck questionnaire was based on five factors of signs of depression including: a) pessimisms, downbeat, self-hate, suicide thoughts, having no decision, slow working b) feeling guilty, punishment expectation c) crying, changed self-image, sadness, d) losing weight, physical pain and tiredness, e) irritability, insomnia and anorexia. This test assesses wide range of Signs and 21 aspects of depression. Each group gain 0 to 30 scores. So, the sum of scores varies from 0 to 63. Validity of this scale is 0.79 and reliability is 0.67 [2].

Beck anxiety test: this test includes 21 groups. Each group gain 0 to 30 scores. So, the sum of scores varies from 0 to 63. Internal consistency of this scale is reported to be 0.92 and the Reliability is 0.75. Reliability of this test were measured by Cronbach alpha in Iran and was 0.78 and has a proper validity.

Copper Smith self-esteem questionnaire: Copper-Smith developed his self-esteem scale based on the theorical experience on Rodgers-Diamond scale. This scale has 58 components which 8 of them are lie-detectors. Over all its 50 components are divided to 4 scales of the ones self-esteem, social self-esteem, family self-esteem and school self-esteem. In addition to 4 subscales, this scale gives another total score. Scoring method of test is 0 and 1. In component numbers 2, 4, 5, 10, 11, 14, 18, 19, 21, 23, 24, 28, 29, 30,32,36,45,47,57 the answer "yes" get 1 scores and no gets 0. Obviously, minimum score of a person may be 0 and maximum score will be 50. If a testee gains 4 out of 8 lie-detecting components test it means that reliability is low and testee has tried to pretend to show him/herself better than reality.

Music therapy Methodology:

Treatment group had 15 sessions of active and passive music therapy (30 minutes each session). Passive music therapy included listening to music. Listening to music included practice and homework so that the testees were asked to listen to the selected music three times a day (morning-noon-night) for Thirty minutes, continuously for 15 days. In other words, they listened to music 45 times during this period. But beginning of active music therapy happened when testees had to listen to music 6 times at least. After that they entered active phase of listening to music which included discussion about listening to music. The activities of this part included discussion about music, performing music with mouth without listening to music, expressing the effects which music have on them, the questions of this researcher about how do they feel? What did you remember? What experiences do they had? During active music therapy, each patient was met 3 sessions with an hour in each session continuously for 15 days. It must be noted that sessions were individually hold. After ending music therapy session, next phase was performed by retest of Beck depression and anxiety test and Copper-Smith self-esteem test. After a month a follow up test was also done.

A list of selected music by the researcher and consultancy of a professional music therapist is followed:
1. Annete, 2. Soledod, 3.Sept way, 4. Coliente, 5.mansement, 6. Chakad piece, 7. Mahoor, 8. Shaggy girl

Findings:

Table 1 presents average and standard deviation of MS patients' scores on depression, anxiety and self-esteem variables.

As table 1 shows the average scores of MS patients in depression have shown reduction in posttest and follow up stage for experiment group rather than the pretest stage (39.13 against 17.07 and 17.33). According to the depression average of experimental group in follow up phase and compared to pretest (39.13) and

posttest(17.33), the average difference of follow up phase with posttest is slight and with pretest is significant. This indicates the persistence of music's effect on MS patients' depression. In addition, the average scores of people's anxiety have reduced from posttest and follow up to pretest (41.07 against 20.93 and 21.73). Based on the average of anxiety for experiment group in following phase (20.93) and comparing it to posttest (21.73) and pretest (41.07), the average difference is slight and is very significant in comparison to pretest phase. This can be sign of persistence of music therapy's effect on patients' anxiety. In addition, the average of self-esteem scores for experiment group in posttest and follow up phase in comparison to pretest phases has decreased. Due to the average score of self-esteem for experiment group in follow up phase (38.47) and comparing it with pretest phase (16.00) and posttest phase (36.67)T the average difference between follow up and posttest phases is negligible but with pretest phase is significant and this illustrates the persistence of music's effect on self-esteem of MS patients.

Investigating the variance and Covariance Uniformity hypothesis for depression, anxiety and self-esteem scores of MS patients:

Table 1: Average and standard deviation of depression scores.

Variable statistics index	phase	Group	average	SD	number
Depression	Pre- test	experiment	39.13	3.37	15
		control	29.53	6.90	15
	Post- test	experiment	17.33	5.06	15
		control	29.20	6.45	15
	Following	Experiment	17.07	5.65	15
		control	27.53	6.43	15
Anxiety	Pre test	experiment	41.07	6.43	15
		control	32.80	7.89	15
	Post-test	experiment	21.73	6.67	15
		control	31.47	7.90	15
	following	experiment	20.93	6.07	15
		control	30.13	7.11	15
Self steam	Pre-test	experiment	16.00	5.07	15
		control	20.20	4.31	15
	Post-test	experiment	36.67	4.71	15
		control	20.47	4.22	15
	following	experiment	38.47	4.34	15
		control	20.40	3.39	15

Table 2: Results of Croiet-Mokhli test of standard variance.

Intragroup effect	Mokhli Coefficient	Approximate Chi-Square	Degree s of freedom	Significance
depression	0.122	58.802	2	0.001
anxiety	0.101	64.078	2	0.001
Self steam	0.145	54.079	2	0.001

As can be seen from table 2, the amount of calculated Croit-Mokhli score is 0.122 for depression, 0.101 for anxiety and 0.145 for self-esteem. These amounts are meaningful at the level of $a<0.01$. So, Lack of uniformity of variance-covariance matrix is proved.

Table 3: results of music therapy effect on MS patients' depression.

Test name	amount	DF hypotesis	DF error	F	Significance level (P)
Pillaie effect	0.590	2	28	20.266	0.001
LambdaiVIcelz	0.410	2	28	20.266	0.001
Hateling effect	1.440	2	28	20.266	0.001
Biggest Roy root	1.440	2	28	20.266	0.001

Table 3 investigated the effect of music therapy on MS patients' depression in posttest and follow up phases compared to pretests phase based on 4 statistics of Pillaie effect, LambdaiVIcelz, Hateling effect, Biggest Roy root. Due to the significance level of these statistics, there is a meaningful difference between MS patients' depression in pretest, posttest and follow up phases.

Table 4: Results of music therapy's effect on MS patients' Anxiety.

test	mount	DFhypothesis	Sd	F	(P)
Pilayee effect	0.618	2	28	22.687	0.001
Lambda vicelz	0.382	2	28	22.687	0.001
Hateling effect	1.621	2	28	22.687	0.001
Biggest roy	1.621	2	28	22.687	0.001

In table 4 we investigated the effect of music therapy on MS patients' anxiety in posttest and follow up phases compared to pretests phase based on 4 statistics. Due to the significance level of these statistics, there is a

meaningful difference between MS patients' anxiety in pretest, posttest and following phases.

Table 5: The results of music therapy on MS patients' self-esteem.

Test	amount	DFhypotesis	Sd	F	(P)
Pilayee effect	0.490	2	28	13.443	0.001
Lambda vicels	0.510	2	28	13.443	0.001
Hateling effect	0.960	2	28	13.443	0.001
Biggest roy	0.960	2	28	13.443	0.001

In table 5, the effect of music therapy on MS patients' self-esteem in posttest and follow up phases is investigated compared to pretests phase based on 4 statistics. Based on the significance level of these statistics, there is a meaningful difference among MS patients' self-esteem in pretest, posttest and following phase.

Table 6: Summary of variance analysis results for investigating the effect of music therapy on depression, anxiety and self-esteem of MS Patients.

Changing sources	Ss	Df	Ms	F	P	Test Power
depresion	2682.067	1.065	2517.859	30.956	0.001	1
error	2512.600	30.891	81.337			
anxiety	2378.756	1.053	2258.131	35.968	0.001	1
error	1917.911	30.549	62.781			
Self steam	2387.467	1.078	2214.437	26.686	0.001	1
error	2594.533	31.266	82.983			

As can be seen form table 6, the results of variance analysis on MS patients' depression scores with a significance level of $a<0.01$ indicates that there is a significant difference between depression scores of three different pretest, posttest and follow up stages. In other words music therapy could significantly influence patients' depression. In addition, the results of variance analysis for anxiety scores with significance level of $a<0.01$ reveals that there is a meaningful difference between MS patients' anxiety in pretest, posttest and follow up phase. In other words, music therapy could have meaningful effect on anxiety of MS patients. The results of variance analysis for self-esteem scores of MS patients with significance level of $a<0.01$ illustrates that there is a meaningful difference among 3 phases of pretest, posttest and follow up. In other words the music therapy has a significant effect on MS patients. Therefor we conclude that the music therapy could reduce the depression and anxiety of MS patients significantly and increase their self-esteem significantly too.

Discussion:

The aim of this study was to determine effectiveness of music therapy on anxiety, depression and self-esteem of patients with Multiple Sclerosis who have recoursed to Tehran MS Patients Association. The findings about the hypothesis that the music therapy is effective on MS patients' depression showed that the music therapy is effective on reduction of depression. So the research hypothesis is confirmed. This result follows the results of some researches by Chwi, Gillam, Lehton, Shaufer, Salgado, Akhilador, Vaskotselos, Aldritch, Schmid and Osterman, Fun Chai, Yung Vang and others).

For example, morira, Franca, Morrira and Lata, showed that music therapy can be a potential treatment for MS patients. They suggested two reasons for this claim. First that music can improve their communication performance and self-expression. Secondly, it provides strategies for dealing with identity-related conditions for these chronic and grueling patients. The results of the research by Goutin, Soua, indicated that music therapy is useful in treating behavioral diseases, anxiety and depression of brain damaged patients.

Also to confirm the results of the research we can point to researches done by Castillo-Perez, Gomez perez, Calvillo Velasco, Perez-Compos, Mayoral [5] with the purpose of assessing the effects of music therapy on depression compared to psychotherapy. They created two groups of depressed patients. Some of them were under psychotherapy based on behavioral therapy and others were exposed to music therapy. The results indicated that the group which was exposed to music therapy showed less signs of depression in comparison to the group which were under psychotherapy. They found that people with Slight and medium level of depression can use music for increasing the effects of psychological supports.

In explaining these findings of research it can be said that the type of themes and music pieces used in current research specially in first 3 songs that had a slow rhythms were effective on reduction of old people's depression. Sad and slow themes evoke sadness, frustration and depression in the listener and help them evacuate their baleful feelings. In this regard, the mental analyze approach in music therapy; musical experiences are known as one of the paths that can make unconscious feeling conscious so that people can use it to evacuate the depressing unconscious emotions and solve them.

In addition, the results of the present research about the hypothesis of effectiveness of music therapy on patients' anxiety showed that the music therapy is effective on reduction of the MS patients' anxiety and our hypothesis is confirmed. The results of the study are consistent with results of Nanbakhsh, ZadehMohammadi,

Jalili and Ahmadinejad. Moreover, they showed in their research that hearing relaxing music reduces the pregnant women's pain and anxiety.

Also Mag Gay, found that a lot of healing is created through music therapy on behavioral mood. Also Dablr and Kyslyng ¬ R Lang, studied the effect of group music therapy in MS patients, after six weeks music programs showed that music therapy can act as a source of mental support, Soothing for anxiety and depression and helps the patient to cope alone with the difficult disease process.

These findings are also confirmed with studies done by Aldrij, Schmidt, Kader, Schmidt and Osterman [1]that showed in their research that music reduces symptoms of depression, anxiety and fatigue in patients with multiple sclerosis, and increases self-esteem and strengthens the sense of self-acceptance in MS patients.

To explain these findings it can also be said that according to various theories of scientists, pleasant music seems to be able to alter brain's mood and encourages functional areas of the brain. Due to that the influence of hearing center on limbic cortical part causes courage and its impacts of on back hearing part result in consciousness, attention and concentration, accordingly we can say that the use of music induces relaxation, improves mental calculation, decreases mental effects of stress. The Music empowers man to communicate, unify and accordance.

Also the results of research on the hypothesis that music therapy is effective on self-esteem in MS patients showed that Music therapy increases self-esteem in patients with MS and the research hypothesis was confirmed. These findings were aligned with Askmyd. He showed that music and music therapy reduce the negative thought about the disease in MS patients and acts as a means to express sense of security, freedom and pleasure. Most of the participants in his research reported that they have experienced individual improvement in their total feeling and also have created the increased feeling of self-esteem and self-confidence.

Present research concluded that music therapy could significantly influence depression. In addition, the results of variance analysis for anxiety scores revealed that there is a meaningful difference between MS patients' anxiety in pretest, posttest and following phase. In addition, based on the significance level of these statistics, there is a meaningful difference between MS patients' self-esteem in pretest, posttest and following phase. This study has also some limitation for diagnosing MS patients' depression and anxiety effect since they were measured just based on depression and anxiety test and no medical diagnosis was done. Based on positive effects of music therapy on depression, anxiety, pain and increasing self-esteem of patients especially MS patients, it is suggested that officials of hospitals to use non-medical complementary methods such as music therapy for relaxing patients. They must study it as a scientific issue. Music therapy as a complementary method should be studied more by the researchers. Acknowledgement The researcher thanks Tehran MS center for cooperating with the researcher to do the experiments of the present research.

In explaining these findings, it can be said that attending in music therapy sessions can create situations to provide social relationships [31] and make positive changes in their physical and mental states, and increase the sense of control over life with it, reduce anxiety and tension and enrich the confidence [31,6].

Overall the findings of present study showed that can use music as a means to promote the mental health of MS patients and put inside the Iran's MS patients Association and hospitals and their families agenda. Using music therapy as a non-chemical and complementary treatment not only decreases the enormous costs of treatment, but also its usage is so simple and easy and even the patients themselves can use it to reduce their mental and physical pains.

About the limitations of the study we should say that the diagnosis of depression and anxiety in MS patients is solely based on depression and anxiety Beck test and the clinical diagnosis was not made by a specialist physician. Given the positive effects of music therapy on anxiety, depression, pain, and increasing self-esteem of patients, especially in patients with multiple sclerosis, officials and hospital administrators are suggested to use non-pharmacologic approaches to relieve pain and anxiety and however effective on vital signs and no adverse effects such as music therapy with other therapeutic methods in order to improve the quality of hospital services to their patients. Hospital administrators and nurses are also recommended to consider music therapy as a scientific category and look at it from a scholarly angle and ask nurses to use music therapy beside useful non-pharmacologic therapies in order to take care of their patients. Also we suggest that the effect of music therapy should be considered as a complementary treatment by researchers for chronic illnesses, including mental and physical health.

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