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Relationship between physical activity and quality of life in patients with multiple sclerosis

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ABSTRACT: *Objective:* The purpose of this study was to study the relationship between physical activity and quality of life (QOL) in patients with multiple sclerosis (MS) in Ahvaz on 2014. *Methods:* The study sample included 150 subjects among all patients who are referred to the MS Association in Ahvaz and were diagnosed as MS disorder. Sampling was done in random method. Data collecting was done using two standard questionnaires. MSQOL-54 questionnaire was used to assess the quality of life and Habitual Physical Activity Questionnaire (HPA) was used to determine physical activity levels. Data was analyzed using Pearson's correlation coefficient test. *Results:* Results showed that there are significant positive relationships between physical activity level and subsets of quality of life ($p<0.05$). *Conclusions:* According to the current findings, it can be concluded that people with higher levels of physical activity have higher quality of life and participating in physical activities and exercise can improve life style of MS patients.

***Keywords*:** Multiple sclerosis, Quality of life, Physical activity.

INTRODUCTION

Multiple Sclerosis (MS) is a severe disorder of the CNS characterized by chronic inflammation, demyelization, gliosis, varying degrees of axonal and oligodendrocyte pathology and progressive neurological dysfunction (Goudarzvand , 2010) resulting in lesions along axons of nerve fibers in the brain, brain stem, spinal cord, and optic nerves (Parkash ., 2008). Women are affected approximately twice as often as males who are more likely diagnosed later in life and have a progressive course of disease (Laurie ., 2010). Immunologists view multiple sclerosis as an autoimmune disease, in which T-lymphocytes specific for myelin antigens start an inflammatory reaction in the central nervous system, which finally leads to demyelination and ultimately axonal loss (Gold ., 2005). This definition of multiple sclerosis, as a T-cell-mediated autoimmune disease, which applies for animal model, is defined as experimental autoimmune encephalomyelitis (EAE) (Gold ., 2005).

There are many therapeutic methods are used as recovering and treatment tools for subjects suffered from MS. Methods such as chemical drugs, exercise and physical activity. Physical activity with different methods (aerobic, aquatic, resistance, endurance, balance and etc) is well accepted and induces relevant improvements in both physical and mental performance of people with MS (Dalgas & Stranger, 2012., Dalgas . 2008). Exercise therapy can be used as a complementary treatment alongside drug treatment to reduce signs of disease (Nornematolahi ., 2012). The benefits of regular aerobic exercise in MS patients include increased capacity, elevated mood (mental state) and the ability to perform daily life tasks. Stretching exercises and yoga are recommended for MS patients (Snook, 2009). Exercise may reverse the effects of an inactive lifestyle adopted by many patients (Gold , 2013; Parkash ., 2012). Some of the reasons for difficulties with exercise MS people may be due to the specific nature of the disease. MS differs from other neurologic conditions for which exercise is commonly prescribed. These differences should be noted by the clinician conducting or prescribing an exercise program to the MS patient (Dalgas , 2012). In applying exercise for MS patients, the main questions can be raised are: if the physical activity can reverse the adverse effects of this disease or can provide an active lifestyle for these people raised from locomotors defects? So, the aim of this study was to study the possible relationships between the level of physical activity and QOL in patients with MS in Ahvaz on 2014.

MATERIALS AND METHODS

Patients

Hundred fifty subjects with MS (20-50 years old) who referred to Multiple Sclerosis Association of Ahvaz were randomly selected as the study sample. All subjects who are voluntary to fill questionnaires must have the following conditions: Subject diagnosed as MS patients with a self assessed Kurtzke Expanded Disability Status Scale (EDSS) score between 1 and 4. No differences were considered for consuming drug. Individuals with other diseases such as cardiovascular disease, liver or kidney failure, symptomatic lung disease, diabetes, thyroid disorders, gout or orthopedic limitations were excluded. All subjects provided written informed consent. After completion of the baseline evaluations, subjects were familiar to study goals and design.

Tools

QOLMS-54 are divided into 12 multiple item scales (physical function, role limitations physical, role limitations emotional, pain, emotional wellbeing, energy, health perception, social function, cognitive function, health distress, sexual function) and 2 single-item scales (change in health, satisfaction with sexual function). A higher score in each scale indicates a better health-related quality of life. Physical health composite and mental health composite scores were calculated as a weighted sum of selected scale scores. The reliability and validity of the MSQOL-54 scores have been confirmed in subjects with MS (Rampello, 2007).

Habitual Physical Activity Questionnaire (HPA) of Beck (1982) was used to collect data on physical activity levels. This questionnaire is made by Beck . (1982) has 25 questions that included three subscales as work physical activity (7 items), sports physical activity (14 items), leisure time physical activity (4 questions). Beck (1982) reported the 0.73 as the reliability of the questionnaire using Cronbach's alpha.

Statistical analyses

To determine the normal distribution of variables, Kolmograv-Smirnov test (KS) was used. After determining the normality of data, Pearson's correlation coefficient test was used to assess the possible relationships between physical activity and subsets of QOL. Values of $p \leq 0.05$ were considered significant. Statistical analyses were performed using the 16 release version of SPSS for Windows.

RESULTS AND DISCUSSION

Results

Demographic data obtained from the subjects are presented in table 1. According to the obtained results, from the 150 subjects, 94 (63%) of them are females and only 37% (56 subjects) of them are male. It was frequently reported that the most percentage of the people with MS are female. It is also observed in this study. The mean age of male is 32.56 years while the mean age of females is 34.16 years old. The mean weight of males is 64.37 kg and the mean weight of women is 53.22 kg.

Table 1. Descriptive data of subjects

Variable		Age	Weight
Mean±SD	Male	32.56±10.19	64.37±15.44
	Female	34.16±12.81	53.22±13.10
n	Male	94	--
	Female	56	--
Percent	Male	37%	--
	Female	63%	--

To determine the relationship between physical activity level and quality of life in this population, the Pearson's correlation coefficient was used and the results are shown in table 2. First column includes the subsets of the QOL. Second column of table involves mean and standard deviations of subscales. The next columns belong to the results of regression test.

Table 2. Results of liner regression for relationship between QOL and physical Activity

	Physical activity (65.50±19.36)				
Variables	Mean±SD	n	R	df	p
Physical performance	64.81±10.34	150	0.42	1	0.000
Physical problem	73.22±18.39	150	-0.38	1	0.000
Psychological problem	73.89 ±21.08	150	-0.33	1	0.03
Satisfaction	59.99±12.00	150	0.32	1	0.02
Mental health	68.15±21.04	150	0.31	1	0.001
Social performance	65.50±12.93	150	0.11	1	0.15
Pain	63.19±23.41	150	0.09	1	0.23
General health	69.71±19.68	150	0.29	1	0.003
QOL score	108.65±20.54	150	0.35	1	0.000

Results of Pearson's correlation coefficient between physical activity score and each subscale of QOL showed that there are positive correlations between the level of physical activity with physical performance (p= 0.000), satisfaction (p= 0.02), mental health (p= 0.003) and general health (p= 0.000). The results also showed that there are negative relationship between the level of physical activity with physical problems (r= -0.38, p=0.000) and psychological problems (r= -0.33, p=0.03). In addition, any significant relationships were not found between the level of physical activity with social performance (r= 0.11, p= 0.15) and pain (r= 0.09, p= 0.23).

Discussion

According to the study findings, there are positive relationships between physical activity level and mood in MS patients. These statements are supported by previous studies (Nusselder , 2005; Ross , 2009; Mavrovouniotis , 2010; Reid , 2010; Mirjam , 2010). Ross . (2009) showed that an increase in physical activity among patients can reduce their level of disability. They also found that patient people, who regularly participate in sport activities, have a better quality of life and independence in their lives. Path of leisure time physical activity affects on all indexes quality of life.

Several studies have indicated the beneficial effects of exercise on various disorders such as diabetes, asthma and hypertension (Sahay, 1986, Nagendra, 1986, Selvamurthy, 1998). General fatigue is a dominating problem for the majority of patients with MS (Svensson, 1994). Training appears to have benefited individuals by reducing the energy expenditure during walking. Even small savings in energy for those with more restricted mobility could be functionally important, allowing them to be active for longer periods of time (Snook, 2009). It has been reported that the practice program improved V_{O2} (Raju, 1994), heart rate and metabolic rate (Telles, 2000) that probably would be beneficial for improvement of endurance in MS patients.

Laurin . (2001) reported that physical activity level at baseline was associated with lower risks of cognitive impairment, Alzheimer's disease, and dementia of any type five years after assessment. On the other hand, the animals in the motor skill group showed a larger increase in synapses in the cerebellum than the other two groups. Other studies have shown similar effects of treadmill exercise on the vasculature in the motor cortex of middle aged monkeys (Kramer , 2005).

Exercise training can be resulted in increased mobility, improved neural activity, weight loss, improvement of psychological factors (Depression and anxiety) and increase muscle strength to reduce fatigue in people with MS (Nicole , 2010). Training programs will involve both systems is about balance in patients with multiple sclerosis. Both exercises are effective in preventing the fall, stimulating deep receptors, increase muscle strength, flexibility and motor control involved (Rasova, 2006).

Endurance training can improve aerobic capacity, flexibility and balance which is the result of neural activity. The resistance training by reducing muscle spasms, sensory loss and loss of muscle weakness disorders improve the balance (Kileff 2005).

Results of current study also showed that a high level of physical activity is associated with psychological wellbeing. Physical activity has also a significant impact on shaping life expectancy. This trend may reflect the manner in which individuals on to perform physical activities; especially exercise which can have a positive attitude to the future (Nusselder , 2005). People, who have a higher life expectancy, can be used in the future to develop specific goals and ways to achieve them, and hope that these goals are reachable. Based on path analysis, physical activity, as sport, has positive effects on mental health of all people including life expectancy, increases self-esteem, confidence esteem, self-confidence, life expectancy, self-worth and life satisfaction, therefore efforts should be considered that all population consider physical activity as an essential act in increase hope to the lives (Popham & Mitchell, 2006). It is clear that people who are hope to the future, have positive thinking about problems that causes health climate in mental and psychological health of the community and its will lead to the high prosperity and productivity. This will not be achieved unless the Physical activity and exercise be considered as an integral part of life.

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