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Original Article

Fall related self efficacy: A significant barrier for physical activity in ambulatory multiple sclerosis patients

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Abstract

Aim: Increasing the level of physical activity in multiple sclerosis (MS) patients is very important to cope with the symptoms associated with disease. The aim of this study was to analyze the psychosocial and physical barriers related to physical activities in MS patients.

Material and Methods: Fifty four MS patients who were able to walk at least 100 meters without walking aids were enrolled in this study. The patients were evaluated for their level of physical activity, walking distance, severity of pain and fatigue, fall related self-efficacy and their level of social support.

Results: There were no correlation was found between the level of physical activity and the negative symptoms of pain and fatigue (rho: 0.-256 p: 0.06- rho: -0.218 p: 0.112 respectively). While the correlation of the level of physical activity with the level of ambulation was low, that of the fall related self-efficacy was found to be moderate (rho: -0.590, p=0.000). Additionally, no correlation was found with the level of social support (rho: -0.185, p=0.181).

Conclusion: Pain and fatigue alone do not effect physical activity level in MS patients. However, fall related self-efficacy is a significant predictor of physical activity. It should not be ignored in programs aimed towards increasing physical activity.

Keywords: Multiple sclerosis; physical activity; fall related self-efficacy; fear of falling

INTRODUCTION

Multiple sclerosis (MS) is a chronic disease characterized by inflammation, demyelination and axonal injury of the central nervous system. Motor and sensory loss, fatigue, ataxia and coordination disorders, cognitive function disorders, pain and depression are examples of the many signs and symptoms seen in MS patients (1).

According to the World Health Organization, physical activity is defined as any body movement brought about by the skeletal system and requiring the expenditure of energy; and a lack of it can lead to many health problems (2). Compared to active and sedentary individuals of the same age group, physical activity in MS patients has been shown to be lower using both objective methods (such as accelerometric measurements) and subjective methods (3) .

It has been shown that not only the level of physical activity is low in severely impaired and primary progressive MS patients but also factors such as the level of self-efficacy, enjoyment, pain and fatigue are implicated (4-9). Additionally, previous studies have clearly shown that with increasing level of physical activity, there is a decrease in symptoms such as pain, fatigue and muscle weakness (10-12). For these reasons, it is quite important to increase the level of physical activity to cope with the patients' symptoms.

Many studies have focused on the physical parameters of physical activity in MS patients, the number of studies done on the psychosocial aspects is limited and their results are controversial. The aim of this study was to analyze not only the physical factors influencing physical activity but also psychosocial factors such as social support or fall related self- efficacy.

MATERIAL and METHODS

Study design

This study was approved by the Hacettepe University

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Committee of Ethics for Non-Interventional Research Studies and took place from March 2019 to May 2019. This cross-sectional and descriptive study was carried out by the Faculty of Physical Therapy and Rehabilitation and included 54 outpatient MS patients admitted to the Hospital Neurologic Rehabilitation Department.

Participants

The participants included in this study were diagnosed with MS by neurologists, are between 18 and 65 years old, have no cognitive and visual deficits which can affect the reading of the survey, has a mini mental test score above 24 and an Expanded Disability Status Scale of 5.5 and below. Patients with additional neurological and orthopedic problems, and who have experienced a heart attack in the last 3 months were excluded from this study. All participant signed written informed consent form.

Evaluations

Evaluation of physical activity

This was done by using the Global Physical Activity Questionnaire (GPAQ). The domains (activity at work, travel to and from places, recreational activities) where the physical activity is carried out is asked separately in GPAQ. Activites of moderate and high intensity are enquired about in the sections pertaining to job and free time while those of moderate intensity in the travel section (walking, cycling). There is an additional question about time spent sedentarily. At the end of the survey, the total time spent in physical activity is calculated in MET-minutes. This measurement of MET-minute obtained from the survey is used as a variable. An activity of moderate intensity corresponds to 4 MET-minutes and those of high intensity to 8 MET-minutes. The total weekly MET-minute is thus calculated by multiplying by its corresponding scale (13).

Evaluation of the psychosocial factors

Social support and self-efficacy related to falls are among the psychosocial factors which were evaluated. The multidimensional scale of perceived social support (MSPSS) and Falls Efficacy Scale were used for these purposes.

Taken from 3 different sources, the perceived multi-dimensional social support scale is easy to use and subjectively assesses the level of social support. The scale is further categorized into support obtained from family, friends and special individuals (14).

The Falls Efficacy Scale – International (FES-I) is used to evaluate the fear for falling. This scale assesses the self-efficacy of individuals during their fall-free daily physical activities. It is a reliable test related to balance and walking, and can predict the risks of falling in future. The scale comprises of 16 parts which are answered by individuals in the form of no concern about falling, some concern about falling and severe concern about falling. The score lies in the range of 16 to 64 (15).

Evaluation of the physical factors

Evaluation of fatigue: The assessment is done using the Fatigue Severity Scale. Individuals can score from 0 to 7 from this scale made up of 9 questions. Higher scores correspond to more fatigue. It takes into account the status of fatigue for the last month from and including the day on which the forms are filled (16).

Evaluation of pain: The intensity of pain was assessed by using a picture of a 10 cm analog scale. The patients were asked to point their level of pain with 0 meaning no pain and 10 being the highest level of pain (17).

Evaluation of ambulation: This was recorded as the distance that the patients could walk without aid or rest.

Statistical analysis

The IBM SPSS Statistics 23 (Statistical Package for Social Sciences) analysis program was used for the statistical analysis. For the descriptive statistics, mean and standard deviation were given for the quantitative parametric variables, median and minimum and maximum values for the non-parametric variables, and frequency and percentage values for the qualitative variables. The Pearson correlation analysis was used to test for parametric variables and Spearman correlation analysis for non-parametric variables. A $p<0.05$ value was considered as statistically significant for the analyses.

RESULTS

This study analyzed the physical and social factors limiting physical activity in MS patients and included 54 patients who met the inclusion criteria to join the study. Table 1 shows the demographic information and the disease course of the patients. Details of the physical and psychosocial factors are shown in Table 2.

According to the Global Physical Activity Scale, 37% (n=20) had high, 38.9% (n=21) had moderate and 13% (n=13) had low level of physical activity.

Table 1. Patients' demographic variable and information about disease course

	Min-max	Mean ±SD
Age (year)	21-65	39.5 ± 11.35
BMI (kg/m²)	17,11-32,81	24.74±3.33
MS Duration	1-26	9.62±6.09
	N	%
Gender (F/M)	30/24	55.6/44.4
MS Type RRMS/SPMS/PPMS	30/14/10	55.6/25.9/18.5
EDSS (median-ıqr)	4 (2-5)	

BMI: body mass index F: female M: male RRMS: Relapsing Remitting MS SPMS: Secondary Progresive MS PPMS: Primary Progresive MS SD: Standart deviation EDSS: Expanded Disability Status Scale

Association with physical factors

When factors like walking distance, pain, and fatigue were taken into account, physical activity was found to be associated only with walking distance (p=0.036). There was no association with pain and fatigue

(p>0.05) (Table 3)There was no difference in the level of physical activity between males and females (p=0.398).

Association with psychosocial factors

No relation was found between physical activity and social support (p>0.05) (Table 3). However, there was a moderate association with the fear of falling (p>0.05). When grouped according to the level of education, no difference was found in the level of physical activity in between the groups (p=0.852). Again, there was no difference when grouped according to their working status (p=0.396).

Table 2. Physical Activity and Physical-psychosocial factors

	Min	Max	Mean±SD
GPAQ	0	23280	3180.07± 4179.54
FSS	17	63	48.37±12.12
FES	16	56	30.54±10.17
MSPSS	19	84	62.07±17.68
VAS	0	10	3.5±3.39

BPAQ: Global Physical Activity Questionnare
MSPSS: The Multidimensional Scale of Perceived Social Support
FSS: Fatigue Severity Scale FES: Fall Efficacy Scale VAS: Visual Analog Scale Min: Minimum Max: Maximum

Table 3. Correlation between physical activity and physical-psychosocial factors

		GPAQ	FSS	FES	MSPSS	VAS	Ambulation
GPAQ	rho	1	-0.218	-0.590*	-0.185	0.256	0.286*
	p		0.112	0.000	0.181	0.062	0.036
FSS	rho		1	0.552*	-0.079	0.443*	-0.016
	p			0.000	0.568	0.001	0.908
FES	rho			1	0.107	-0.056	0.386*
	p				0.443	0.687	0.004
MSPSS	rho				1	-0.022	-0.027
	p					0.875	0.844
VAS	rho					1	0.135
	p						0.329
Ambulation	rho						1
	p						

GPAQ: Global Physical Activity Questionnare
MSPSS: The Multidimensional Scale Of Perceived Social Support
FSS: Fatigue Severity Scale FES: Fall Efficacy Scale
VAS: Visual Analog Scale

DISCUSSION

In this study aimed at demonstrating the physical and psychosocial factors which can affect the level of physical activity in ambulatory MS patients, the results have shown that there is a weak relation of physical activity with walking distance and a moderate relation with the fall related self-efficacy.

In healthy population, it is known that males are more physically active than females (18). However, the studies done in MS patients show conflicting results. In 2015, Kahraman et al. have shown in a study which included 52 minimally affected MS patients that similar to a healthy population, women with MS were less physically active to men with MS. However, this difference was found by using accelerometric measurements compared to Godin Free Time Exercise Survey which showed no difference between the 2 groups (19). In contrast, Anens et al. have shown in his study, in which 287 MS patients were surveyed, that the males had a lower level of physical activity and noted that the males were most physically affected (20). Our study has shown no difference between men and women. Since the participants in this study had different impairment levels, a direct comparison would have led to false results. In our opinion, more reliable results could have been drawn if males and females were compared by categorizing them into homogeneous groups of the same level of disability.

While some studies focused on finding the relation between physical activity and fatigue support the hypothesis that MS patients with more fatigue are less physically active (9, 19, 21), there are others which have shown that there is no relation and that the physical activity preferred by the MS patients depend on individual preferences and choices. Moreover, confounding factors such as patient age and MS-related depression and anxiety have been thought to influence this relation (21-23). Our study found a similar result of no relation between physical activity and fatigue. Similarly, the inability to show a relation between pain and physical activity supports the idea that the preference of physical activity depends on individual factors and preferences. Additionally, although negative symptoms alone do not determine the level of physical activity, factors especially like pain, fatigue and depression together have been found to affect physical activity (24).

The level of self -confidence of an individual's ability to carry out their daily activities without falls and loss of balance reflects the fall related self – efficacy (25-27). Although the relation between self-efficacy and the level of physical activity has been shown in previous studies (4, 7, 28-30), limited research has been done on the relation between the fall related self -efficacy and physical activity (20, 31, 32). Peterson et al. have shown that there is a relation between, fear for falling and using a walking aid, and physical activity (32). However, although Kasser et al. have reported that a relation exists between physical activity and parameters such as balance, loss of strength and walking; fear of falling alone was a better predictor of the level of physical activity than other factors and symptoms (31). Despite the low correlation found in this study between the level of ambulation and physical activity, the moderate correlation found with fear of falling supports the findings in the study.

Previous studies have shown the level of social support in MS patients to be correlated to physical activity (8, 33,

34). However, no correlation was found between these two parameters in this study. We attribute this finding to the fact most of the participants in our study had a good social support.

This study has potential limitations. The physical activity assessment could be done by objective methods but accelerometric assessments are expensive and are not easy to use in clinical settings. Also it could be compared the patients according to their disability level. But our sample size was not appropriate for such comparison.

CONCLUSION

To conclude this study, no other factors were found to be correlated to falls except self-efficacy and walking distance. Keeping in mind the correlation between falls and self-efficacy, limits of stability and strength asymmetry in the lower extremities, we suggest that programs aimed at increasing physical activity in MS patients should allow for exercises directed towards improving these problems. Additionally, irrespective of the level of mobility in patients, it should be clear that fear of falling limits physical activity and strategies should be developed to increase physical activity even in high mobility patients.

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Ethical approval: This study was approved by the Hacettepe University Committee of Ethics for Non-Interventional Research Studies and took place from March 2019 to May 2019 (karar no: 2019/07-27 protocol no: GO 19/284.

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