Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XX, ISSUE 2 Supplement, 2020, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST,
DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Science, Movement and Health, Vol. XX, ISSUE 2 Supplement, 2020
September 2020, 20 (2 Supplement): 215 - 221
Original article

OUTCOMES AND PATIENTS' FATIGUE FOLLOWING INDIVIDUALIZED PHYSICAL THERAPY TREATMENT FOR PATIENTS DIAGNOSED WITH IN MULTIPLE SCLEROSIS

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Abstract

Problem statement: Multiple sclerosis is a demyelinating disease that involves the central nervous system, and is defined by neurodegeneration, inflammation, demyelination and axonal injury, inducing extensive physical deterioration. The aim of this study was to identify the results after movement sessions and physical exercises for patients with multiple sclerosis.

Methods: A lot of 10 patients with multiple sclerosis accepted to participate in this study. The patients performed elected physical activities daily for one hour in one session or devided, dependent to their strength, for a period of six months. We performed interviews and the following questionnaire before and after the period of study: the Modified Fatigue Impact Scale Questionnaire and compared the results. The patients' results were compared to a control group of multiple sclerosis patients that did not perform any physical therapy. The both groups of multiple sclerosis patients were on the same stage on the EDSS scale.

Results: The most relevant beneficial results came from the cognitive profile, the patients from the physical activity group, experienced important improvements of their fatigability and depression and anxiety levels. For patients with multiple sclerosis, improving the quality of life by lowering the level of depression and also lowering the level of anxiety is very helpful.

Conclusions: The main idea is that exercise seems to be advisable for patients with multiple sclerosis as part of the neurorehabilitation process and that exercise plays a relevant role in improving the quality of life between patients with multiple sclerosis.

Key words: physical therapy, multiple sclerosis, quality of life.

Introduction

Multiple sclerosis represents the principal disease of neurological disability in young and middle-aged adults, also presenting multiform manifestations (Sirbu, 2015). The course of multiple sclerosis is variable, from a simple transient neurological deficit to the most severe form. The patients are diagnosed usually between 20 and 40 years of age, with 85% occurring between 15 and 50 years; and the majority of the patients have approximatively 30 years old when the diagnosis is made. This disease is most prevalent in women, in a proportion of approximately 2: 1.

Multiple sclerosis is the principal representant of a group of disorders known as demyelinating diseases (Sirbu, 2016). They present immune-mediated destruction of myelin, with relative preservation of other elements of the nervous tissue. The lesions arise, especially, in the periventricular substance, in the corpus callosum, in the optic tract, cerebellum, trunk and medulla. The "plaques" are areas of demyelination with partial or total preservation of the axon Its course is characterized by the occurrence of outbreaks, defined as the appearance of new symptoms, or a sudden worsening of previous deficits, lasting more than 24 hours. Two outbreaks must be separated by at least 30 days difference.

The characteristics of the motor symptoms include spasticity, reflex spasms, contractures, gait disorder, fatigue, cerebellar and bulb symptoms represented by balance deficit, nystagmus, intentional tremor, difficulty in swallowing and breathing (Sirbu, 2017). Sensory symptoms that appear in multiple sclerosis are: numbness, paraesthesia, dysesthesia, distortion of superficial sensitivity and musculoskeletal pain (Stroe, 2020). Visual symptoms are represented by: decreased acuity, double vision, scotolma and eye pain. The sudden appearance of an optic neuritis, without any

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*the abstract was published in the 20th I.S.C. "Perspectives in Physical Education and Sport" - Ovidius University of Constanta, May 28-29, 2020, Romania
Received 2.04.2020 / Accepted 05.05.2020

other sign or symptom of the central nevous system, is often interpreted as the first symptom of multiple sclerosis. As for bladder-intestinal symptoms, they appear with urinary retention, urge incontinence and / or increased urinary frequency and constipation (Docu Axelerad, 2020), (Stroe, 2020).

Fatigue is one of the most frequent manifestations of multiple sclerosis and can be very debilitating. Moderate exercises that conserve energy, use of assistive devices, simplification of work and cooling can be effective for its control (Stroe, 2020), (Docu Axelerad, 2020).

In physical therapy intervention, the therapist and patient work as a team to decrease the limitations of the disease, increase functional capacity, growing the quality of life in general and preventing debilitating complications (Docu Axelerad, 2020).

Physical therapy promotes the quality of movement patterns, promotes the aquireing of motor skills, maintenance of muscle strength, motor coordination and gait pattern, postural stability, as well as a psychological adjustment between patient and family and understanding of the symptoms of multiple sclerosis (Docu Axelerad, 2020).

Materials and methods

A lot of 10 patients with Relapsing-Remitting Multiple Sclerosis, with the Expanded Disability Status Scale (EDSS) < 3.5 participated in this study. The patients were recruited from doctor Docu Axelerad Any' s private clinic.

The inclusion criteria were: a diagnosis of multiple sclerosis according to the criteria of Poser et al, a score of 3,5 or less on the Expanded Disability Status Scale (EDSS) and age between 20 and 50 years.

The exclusion criteria were: steroid or immunosuppressive therapy within the past month, diagnosis was not clearly established, the presence of an acute relapse or severe cognitive deficits, or the presence of signs of any psychiatric disorders or systemic disease. Also, the patients were excluded if they had participated in a regular exercise program within 3 months before the study.

All subjects were told about the purpose of the study and written informed consent was obtained prior to entering the study.

Neurological examination

A neurological examination was assessed using the Expanded Disability Status Scale (EDSS). The disease characteristics, clinical form, number of exacerbations, medical treatment, duration of illness were recorded. Expanded Disability Status Scale scores ranged from 2.5 to 3.5 and were not statistically different from one another ($p > 0.05$).
The exercises were performed for an hour for six months and the aerobic program consisted of the following exercises and variations of it, but with the personalization for every patients in part.

1. Supine position: flexion of hips and knees and extension of each limb, with the feet entirely sitting on a base.
2. Abduction of the hips and adduction of each limb with feet supported, knees bent: and afterwards extended.
3. Flexion of the hips and knees and extension of each limb, with the heels raised from the base.
4. Heel from one of the limbs to the opposite leg (fingers, ankle, tibia and patella).
5. Heel from one of the limbs to the knee opposite son, sliding down the crest of the tibia down to the ankle.
6. Flexion of hips and knees, and extension of both limbs, both legs together.
7. Synchronized movements of both members: flexion of one leg while extending the other.
8. Sitting: knee extension and flexion of each limb: progress by making time.
9. Abduction and adduction of the hips.
10. Alternate positioning of the feet to a specific target (using markings on the floor, or a grid).
11. Get up and sit: under a specific count.
12. Standing: positioning the foot to a specified target (floor markings on a grid).
13. Weight transfer.
14. Walking: On the side or forward, under a specified count
15. Rotate, under a specific count (the marks on the floor can be useful in maintaining a stable support base).

The results of the training were tested using Modified Fatigue Impact Scale. The results of the training were statistically assesed using measures of paired samples test. A value of $p < 0.05$ was taken as significant. All analyses were performed using IBM SPSS Statistics 20.

Results

Patients obtained the mean score of: 58.50 ± 7.27 points at the Modified Fatigue Impact Scale test before the period of the training sessions, as opposed to the score that the patients obtained after the training period: 36.50 ± 3.68 points, revealing a statistically significant increase of $p < 0.001$ (Figure 1).

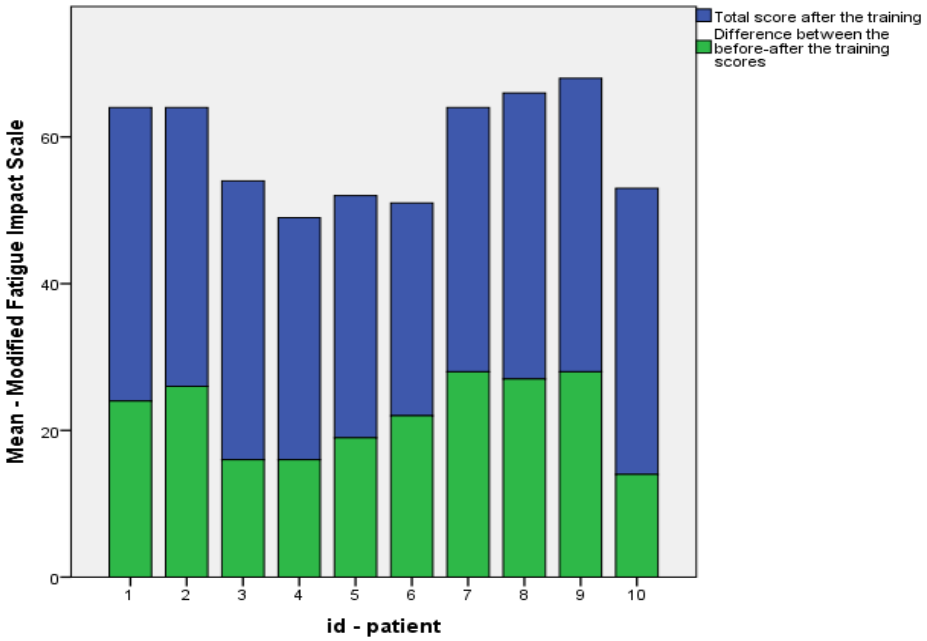

Figure 1. The mean results that every patient obtained at the Modified Fatigue Impact Scale

Patients obtained the mean score of: 25.70 ± 3.26 points at the Physical Subscale of Modified Fatigue Impact Scale test before the period of the training sessions, as opposed to the score that the patients obtained after the training period: 15.80 ± 2.09 points, revealing a statistically significant increase of $p < 0.001$ (Figure 2).

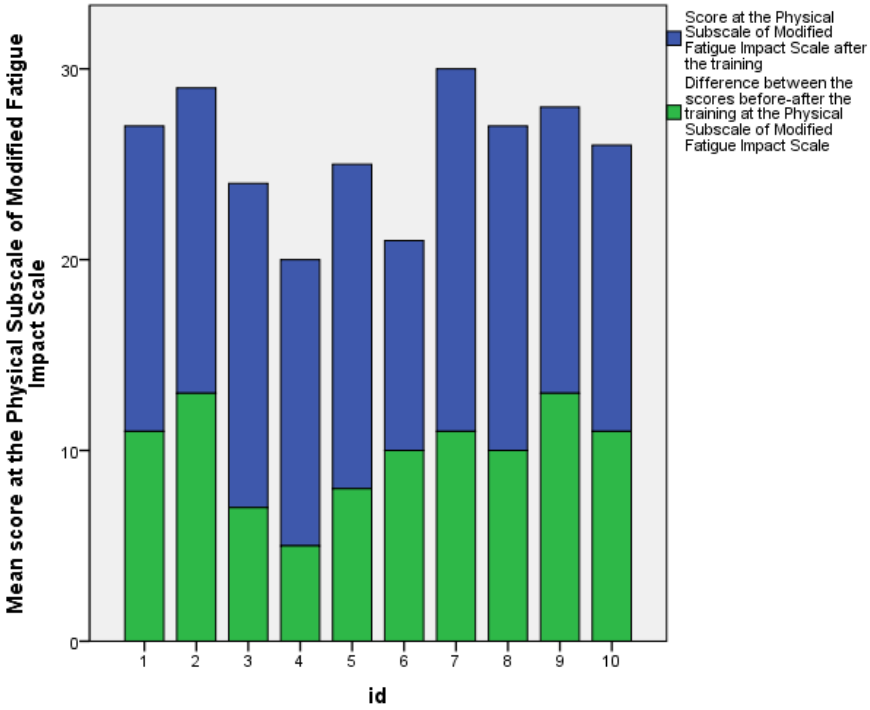

Figure 2. The mean result that every patient obtained at Physical Subscale of Modified Fatigue Impact Scale test.

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Patients obtained the mean score of: 29.60 ± 3.62 points at the Cognitive Subscale of Modified Fatigue Impact Scale test before the period of the training sessions, as opposed to the score that the patients obtained after the training period: 18.80 ± 2.61 points, revealing a statistically significant increase of $p < 0.001$ (Figure 3).

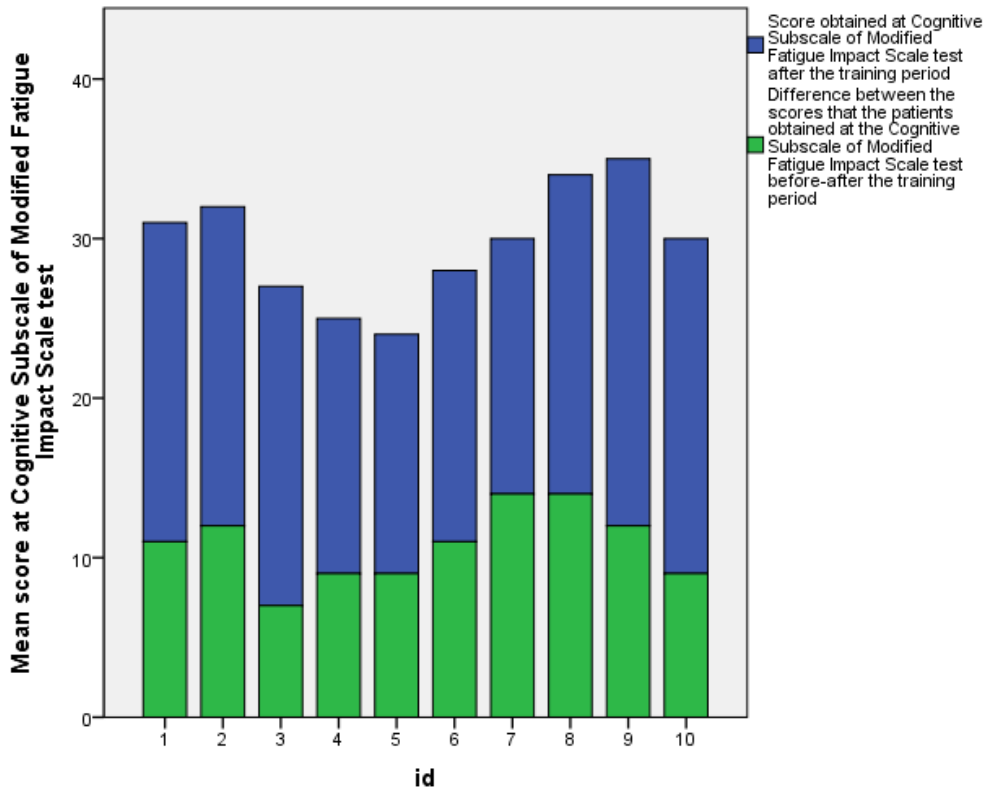

Figure 3. The mean result that every patient obtained at Cognitive Subscale of Modified Fatigue Impact Scale test.

Patients obtained the mean score of: 4.10 ± 1.37 points at the Psychosocial Subscale of Modified Fatigue Impact Scale test before the period of the training sessions, as opposed to the score that the patients obtained after the training period: 1.90 ± 0.99 points, revealing a statistically significant increase of $p < 0.001$ (Figure 4).

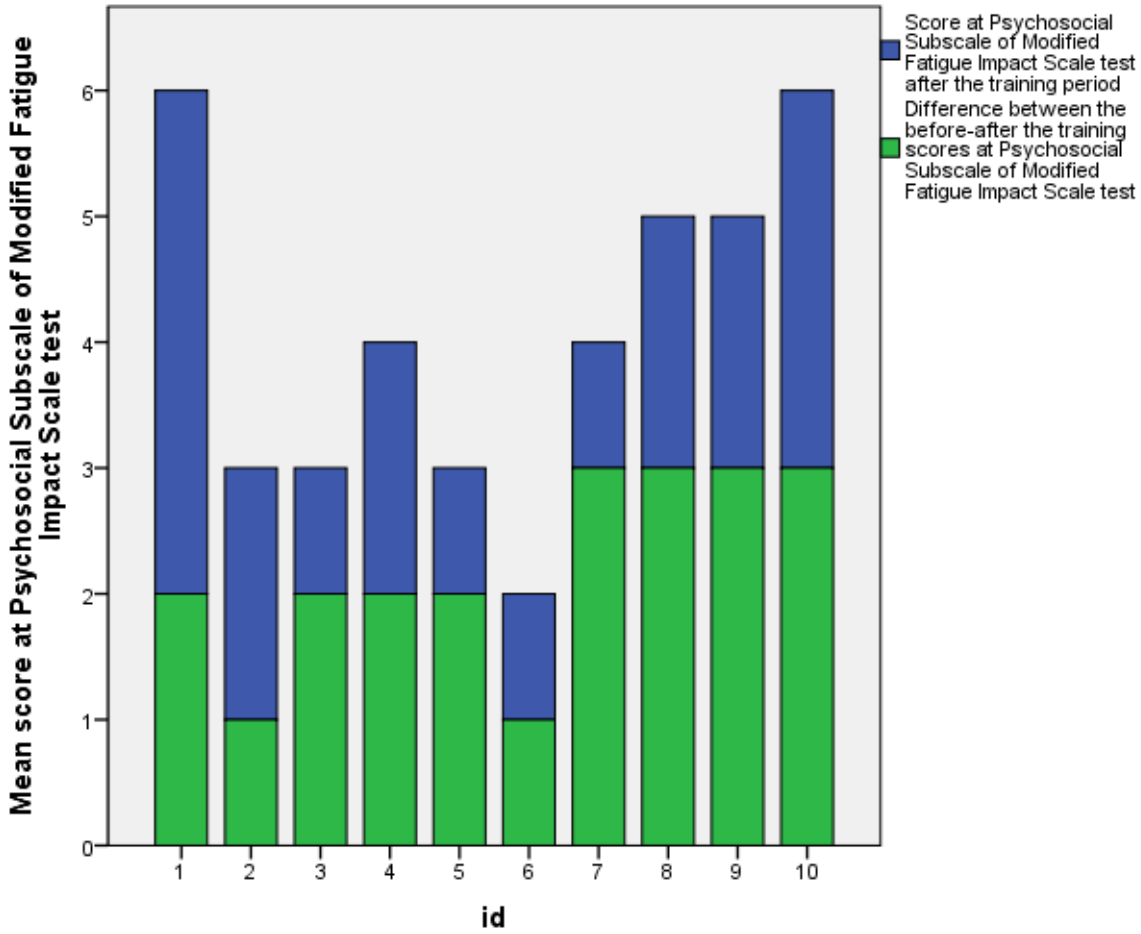

Figure 4. The mean result that every patient obtained at Psychosocial Subscale of Modified Fatigue Impact Scale test.

In this study, the results showed important, being statistically significant ($p < 0.001$) for the results that the patients obtained before and after the training session at the Modified Fatigue Impact Scale test and also, for the subscales of this test: Physical Subscale, Cognitive Subscale and Psychosocial Subscale.

Discussion

Studies carried out indicate several benefits of physical therapy intervention in various aspects of patients with multiple sclerosis, making it essential to assess whether the process of rehabilitation of these patients improves functionality and quality of life and, at the same time, minimizes their co-morbidities, increasing their life expectancy (Docu Axelerad, 2019), (Docu Axelerad, 2020), (Falup-Precurariu, 2019), (Dantes, 2020). Studies performed in the literature show an important effect of pilates training on physical fitness and wellbeing in eldery (Bullo, 2015). In another study on pilates improvements brought in the multiple sclerosis patients show interesting findings and new relations between sport and quality od life (Fox, 2016), (Latimer-Cheung, 2013), (Guclu-Gunduz, 2014), (Kalron, 2017), (Marandi, 2013). Also, studies showed that an improvement in the physical state of the multiple sclerosis patients is obtainable, even in the core and stability area (Freeman, 2010). The present study, through specific assessments for changes in balance, functionality and quality of life, applied a various physiotherapy exercises in order to promote a significant improvement in the physical and functional parameters of the patients (Docu Axelerad, 2020), (Stroe, 2020).

Conclusion

In this study was observed the impact of physical exercise on fatigue in patients with multiple sclerosis. On the period of the training and shortly after, the patients experienced a decrease in the level of fatigue and also, subsequently an increase in their quality of life, and also in their physical, cognitive

and social features. The impact of training in multiple sclerosis on fatigue was also observed in studies in literature and this fact also sustains the quality of our study (Tomruk, 2016) , (Skurvydas, 2011). The possible beneficial effects of exercise in patients with multiple sclerosis needs more studies to be performed, and these findings bring an enlight on the subject (Stroe, 2020), (Docu Axelerad, 2020).

References

Bullo V, Bergamin M, Gobbo S, . et al. The effects of Pilates exercise training on physical fitness and wellbeing in the elderly: a systematic review for future exercise prescription. Prev Med. 2015; 75: 1– 11.

Docu Axelerad A, Docu Axelerad D, Docu Axelerad S, Stroe A Z, Walking in Parkinson's disease. Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH. 2019; 19 (2): 350 – 354.

Docu Axelerad A, Stroe A Z, Docu Axelerad S, Docu Axelerad D, Divinity in dementia. Proceedings DIALOGO. 2019; 6 (1): 187 – 194. DOI: 10.18638/dialogo.2019.6.1.18, ISBN: 978-80-973541-1-4 (html), 978-80-973541-0-7(pdf), ISSN: 2393-1744.

Docu Axelerad A, Stroe A Z, Docu Axelerad S, Combating Depression in Parkinson's Disease with Melotherapy. Proceedings DIALOGO. 2019; 6(1): 195 - 202, DOI: 10.18638/dialogo.2019.6.1.19, ISBN: 978-80-973541-1-4 (html), 978-80-973541-0-7(pdf), ISSN: 2393-1744

Docu Axelerad A, Stroe A Z, Docu Axelerad S, How religiosity affects Parkinson's disease symptoms. Proceedings DIALOGO. 2019; (6) 1: 203 - 211, DOI: 10.18638/dialogo.2019.6.1.20, ISBN: 978-80-973541-1-4 (html), 978-80-973541-0-7(pdf), ISSN: 2393-1744.

Dantes E, Docu Axelerad S, Stroe A Z, Docu Axelerad D, Docu Axelerad A, The rehabilitation of hemiparesis after stroke. Ovidius University Annals, Series Physical Education and Sport / Science, Movement and Health. 2020; 20 (1): 5 – 9.

Docu Axelerad A, Jurja S, Stroe A Z, Docu Axelerad S, Docu Axelerad D, The role of physical exercise in multiple sclerosis. Ovidius University Annals, Series Physical Education and Sport / Science, Movement and Health. 2020; 20 (1): 10 – 15.

Docu Axelerad D, Docu Axelerad S, Dantes E, Stroe A Z, Docu Axelerad A, Mixed dementia and physical exercise. Ovidius University Annals, Series Physical Education and Sport / Science, Movement and Health. 2020; 20 (1): 16 – 21.

Docu-Axelerad A, Stroe ZA, Docu-Axelerad D, Docu-Axelerad S. Multiple sclerosis and yoga. Arch Balk Med Union. 2020;55(1):154-158. https://doi.org/10.31688/ABMU.2020.55.1.19

Docu Axelerad A, Docu Axelerad D. Comparative Evaluation of Pregabaline, Gabapentine, Sertraline and Duloxetine in Painful Diabetic Non Insulin-dependent Neuropathy. Procedia - Social and Behavioral Sciences. 2015; 191: 469-472.

Falup-Pecurariu, C., Diaconu, Ș., Falup-Pecurariu, O. et al. Acute reversible parkinsonism post-influenza infection. Acta Neurol Belg (2019). https://doi.org/10.1007/s13760019-01215-2.

Freeman JA, Gear M, Pauli A, . et al. The effect of core stability training on balance and mobility in ambulant individuals with multiple sclerosis: a multi-centre series of single case studies. Mult Scler. 2010; 16: 1377– 1384.

Fox EE, Hough AD, Creanor S, Gear M, Freeman JA.. Effects of Pilates-based core stability training in ambulant people with multiple sclerosis: multicenter, assessor-blinded, randomized controlled trial. Phys Ther. 2016; 96: 1170– 1178.

Guclu-Gunduz A, Citaker S, Irkec C, Nazliel B, Batur-Caglayan HZ.. The effects of Pilates on balance, mobility and strength in patients with multiple sclerosis. NeuroRehabilitation. 2014; 34: 337– 342.

Latimer-Cheung AE, Martin Ginis KA, Hicks AL, . et al. Development of evidence-informed physical activity guidelines for adults with multiple sclerosis. Arch Phys Med Rehabil. 2013; 94: 1829– 1836.e7.

Kalron A, Rosenblum U, Frid L, Achiron A.. Pilates exercise training vs. physical therapy for improving walking and balance in people with multiple sclerosis: a randomized controlled trial. Clin Rehabil. 2017; 31: 319– 328.

Marandi SM, Nejad VS, Shanazari Z, Zolaktaf V.. A comparison of 12 weeks of Pilates and aquatic training on the dynamic balance of women with mulitple sclerosis. Int J Prev Med. 2013; 4 suppl 1: 110S– 117S.

Sirbu CA, Dantes E, Plesa CF, Docu Axelerad A, Ghinescu MC. Active Pulmonary Tuberculosis Triggered by Interferon Beta-1b Therapy of Multiple Sclerosis: Four Case Reports and a Literature Review. Medicina. 2020; 56: 202.

Sirbu C.A., Sirbu O.M., Constantin C., SanduA.M., Neuroimunotoxicity of aluminum. Farmacia. 2015; 63(1): 8-10.

Sirbu C.A., Furdu-Lungut E., Plesa C.F., NicolaeA.C., Drăgoi C.M., Pharmacological treatment ofrelapsing remitting multiple sclerosis-where arewe? Farmacia. 2016; 64(5): 651-655.

Sirbu CA, Dragoi CM, Nicolae AC, Plesa CF.History of interferon treatments in multiple sclerosis– 60 years of progress. Farmacia. 2017; 65(1): 14-18.

Stroe A Z, Docu Axelerad S, Docu Axelerad D, Docu Axelerad A, Exercises in Parkinson's disease. Ovidius University Annals, Series Physical Education and Sport / Science, Movement and Health. 2019; 19 (2): 344 – 349.

Stroe AZ, Docu Axelerad A, Docu Axelerad S, Docu Axelerad D. Compulsivity and coronavirus. Proceedings DIALOGO. 2019; 6(2): 146-152. DOI: 10.18638/dialogo.2020.6.2.13.

Stroe ZA, Docu Axelerad S, Docu Axelerad D. Melotherapy- a complementary approach in the symptomatology of multiple sclerosis patients. J Complement Med Res. 2020; 11(1): 164-169. doi: 10.5455/jcmr.2020.11.01.19

Stroe A Z, Docu Axelerad S, Docu Axelerad D, Docu Axelerad A, Neurorehabilitation through exercise in parkinson's disease patients, Ovidius University Annals, Series Physical Education and Sport /Science, Movement and Health. 2020; 20 (1): 67 – 71.

Stroe ZA, Docu Axelerad S, Stuparu AF, Docu Axelerad D. Assessing the effectiveness of yoga, Tai Chi and aerobics on the fatigue of multiple sclerosis patients. TPERJ. 2020; 13(24): 12-18. DOI:10.2478/tperj-2020-0002

Skurvydas A, Brazaitis M, Andrejeva J, Mickeviciene D, Streckis V.. The effect of multiple sclerosis and gender on central and peripheral fatigue during 2-min MVC. Clin Neurophysiol. 2011; 122: 767– 776.

Tomruk MS, Uz MZ, Kara B, Idiman E.. Effects of Pilates exercises on sensory interaction, postural control and fatigue in patients with multiple sclerosis. Mult Scler Relat Disord. 2016; 7: 70– 73.