

Research Article

The Pilates Exercises Role in Recovery of Muscular Performance in women with Multiple Sclerosis

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ABSTRACT

Background and Objects: Multiple sclerosis is a chronic disease of the central neural system that causes weakness muscular. The object of the present research was studying impact of the eight weeks of Pilates exercise on strength and stamina of scapula, abdomen, and paw.

Methods: In the present semi-experimental research thirty women with MS were selected by purposeful sampling method and divided into two groups (of 15 persons); Pilates exercise and control group. Exercise program included eight weeks of Pilates exercise, three sessions each week and each session takes 40-60 minutes. T-test was used for statistical analyzing ($p < 0.05$).

Results: After eight weeks of significance increasing strength and power of abdominal muscles, strength of stamina of scapula and paw's muscles was observed in the exercise group rather than control group ($P < 0.05$).

Conclusion: Regarding findings of the research, Pilates exercise is effective on strength and stamina of muscular of the patient with MS and the patients can make use of Pilates exercise to preserve and increase their muscles' performance.

Key words: Pilates exercise, multiple sclerosis, muscular strength, muscular stamina

INTRODUCTION

Multiple sclerosis is a chronic disease of the central neural system that makes disorder in guidance of neural flow by distraction of million central neural cells. Following the event, the part of muscle of the body loses its capability and efficiency. [1] This disease has the most epidemic of other neurologic diseases among young people aged 20 to 40 in comparison with other diseases. [2] According to statistics of the World Health Organization, about 3.5 million persons are suffering from this disease in the world. The disease is referred to as a 21st-century disease regarding

increasing prevalence of the disease. The most common side effects of the disease include cramp, trembling, diplopia, imbalance and disturbance for walking. [3,4] Muscular strength is the capacity or ability of a muscle or muscular group for exerting maximum strength against a resistance and preserving minimum level strength in muscle or muscular group is important for healthy and natural life. [5] Decrease of muscular strength is one of the main disorders that limit daily activities of patients with MS. Many studies have

shown the decrease of isometric, isotonic and isokinetic and total efficiency of muscles in the patients with MS.[6] Muscular stamina is the potency of a muscle in the frequency of same movements, resistance against steadily pressure or preservation degree of contraction in specified time. In other words, capability of muscles during rather serve activities and long term is called muscular stamina that is interrelated with maximum strength. [7] Muscular stamina in patient with M.S decreases, due to reduction of muscular strength and lack of exercise and metabolic changes of muscular cells.[8] Considering this, MS patients even with low levels of disease usually have no dynamic life. [9] It could be expected that low level of muscular skeletal preparation causes decrease of quality of their life and disability in doing their routine works.

In the past, it was believed that sporty exercise has harmful effects on this disease. So most of time MS patient was advised to refuse physical activities because it was imagined this issue due to the symptoms such as aggravation of symptoms with increasing in body temperature. Unlike previous beliefs, today exercise has affirmative point.

Exercise is related to corporal and psychical healthy and patients who have had physical exercise had better social function and ability to perform their own duty better than before.

So the medical exercise can be used as completed treatment beside medical remedy for decreasing side effects of the disease [9].

It has been known that regular exercise and generally physical activities for preserving healthy and preventing of illness is extremely important, but the role of exercise in MS was a debatable issue for a long term.

Many studies have shown remedial sport correct way can be efficient for recovery of the patients. Use of remedial sporty on MS patients can mention recovery of patient's physical situation, doing better daily activities, spiritual and physical healthy, completion influence of therapy medicinal and control some of symptoms of the disease. A significant physiological adaptation resulting from exercise I neuromuscular adaptation.

Studies suggest that training and exercising applied special mention to a muscle to considering the nature of pressure the muscle might adapt in different way many research have performed about the effect of sporty exercising on recovering the effect of sporty exercising on recovery of operation and skeletal muscular disabilities in patient, affected by MS [1.10] Remege and his coworkers after 6 month mighty and aerobic exercising program reported a significant recovery of muscular stamina of bust[11].

Median Perz et al. after 12 weeks resistive exercising reported that there is significant increasing in dynamic mighty and isometric of lower half muscular but there was not any report about expressive changes in stamina muscular[12].

Kirgard et al. after 12 weeks sever resistive exercising reported that there is significant increase in muscular vigor[13]. Maria Sanchez et al. after vibration exercising reported on expensive increase in vigor muscular extensor in patients with MS[14].

Kolklo Gondoze after 8 week Pilates exercise reported significant increase in strength of upper and lower muscular of MS patients among exercising methods that has been regarded in recent years is Pilates exercising (contology science)[15]. contology consists of creating total harmony between body, mind and spirit.

One of the contology results is restraining of mind in such way that mind takes control of the body which is the body part take order from the person's order[16].

Pilates was introduced and developed by Jozef Pilates in 1920 and it was entered to Iran in 1385, Pilates exercising including tensional and mighty movements that were performed which long the joint dynamical range they should be done with a controlled speed, concentration and deep breath. They are conducted in four experimental levels and the movement are simple and they gradually become more difficult to level 4[17,18].

The research suggests that Pilates exercising is one of the effective exercise method on recovery of muscle performance[15,19].

Considering the main cause of balance and dynamic problems in M.S patients is muscle weakness[1]this style of exercising can be used as exercising method for recovery of dynamic performance and muscle skeletal in MS patients[19]. The female patientswith MS is twice more than men and life expense for people with MS is 10 years less than real age[2].

Increasing in number of women patient and special view point of social to these people cause secretion of disease ,isolation and increasing poverty dynamic of these patient.

The shortage of remedial medicines and being expensive make apparent more than ever importance proper physical activities in controlling this disease

So this research is designed with target of surveying effect Pilates exercising on strength and stamina muscle in MS patient women the method of research.

Samples:

In present study 50 women effect by MS of noxious kind were chosen by purposeful sampling from among the patient referring to MS association of Ahvaz

The qualification entrance testee to research

1. The women those who affected by the noxious and improving MS aged between 25_45 and EDSS< 4.
2. Lack of affection to other neurological disease, cardiac disease, respiratory disease, asthma, epilepsy, blood pressure:
3. No having regular sporty, activity during past 6 month
4. Not smoking cigarettes
5. Spending minimum 6 month of last relapsing of disease

Qualification quit taste of research

1. Discussion of attending in exercising or having frequent absence more than 3 exercising session
2. Doing regular exercising in control group
3. Taking apart exercising group in sporty session except sportive session in this research
- 4.Having experience of attack or relapse of disease during exercise or hospitalization in hospital

5.Changing of patient's drugs during 8 weeks exercising the method of research performance
Primarily dates for accepting in research was studied by using of archived information of patient 's file in multiple sclerosis congress of Ahwaz and people who have entrance qualification was determine by respective responsible by doing essential cooperation
Demographic information was gathered by using of substantative questionnaire.

After deliberately sign testimonial by volunteer patient they settled accidentally in the Pilates group and control group

The patient according to drug placed into 3 consumer groups of Avon, sinox, Ribof that of from this aspect there is no signification different between groups.

The balanced test was given to all testees a day before beginning interferences, pretest which including muscular might test, might of muscles abdominal and back endurance test of muscles abdominal and scapula.

Operation test was given to all tested 18hours after test interference session with some protest condition

Measurement:

Height: for height measuring, testee was asked to stand by wall without shoes at time of measuring behind of feet ,hip and back of head to wall and metatarsus be in touch to floor and in such way her body keep quire smoothly front ward. Person s height was recorded by using seka height measurment incentigrad in respective table.

Weight (kilogram) body mass index and percentage of body fatness:

For measuring Weight and body mass index was used of composition body instrument.

Measuring endurance of the abdominal muscles:

For measuring endurance of the abdominal was used of half sit-up test .in half set-up test must lift body just as old body set-up typically in this test patient do repeton as much as she can 60 second and use a special condense

Measurement durance of scapula:

In this research for Measurement insurance of scapula was used of reformed swimming test on

floor in until tiredness. In reformed test swimming, the patient instead of placing it's forepaw on floor, puts her knees while, locked in eachother. patient open her hands by pushing ground and stretch her body in such way can draw a direct line from shoulder go in to wrist .then the patient as possible as closes all her body from chest to thigh to ground and pull down her body .the number of reputation compute in second.

Measuring strength of muscular abdominal:

This research include 8 degrees of strength from very weak to elite that patient for going every degree it's.

was programmed by Pilates coach under supervision sport psychologist and experienced neurologist.

If patient reported that she feels tired and have pain muscular her program was balanced reclining of repetition and decreasing total time also an expert in physiotherapy and

The specialist doctor of association had given her number to researcher for emergency situation and all of exercising did in attending a nurse.

The exercising of training group did in 24 sessions during 8 weeks and 3 times a week the exercise was done between 10 to 11 in the morning.

degree	Level strength	Explanation performance
1	Very weak	Even she can't does a sit-up
2	weak	Wrist while strength .teach tight
3	acceptable	Elbow while stretching ,reach to thigh
4	medium	Hands are cross from on stomach and chest reach
5	well	Hands are cross from on chest and arms reach to thigh
6	Level best	Hands have curved like a hook in behind of head and hands reach to thigh
7	Very well	Chest reach to thigh with 2/5 kilograms weight in behind of head
8	Elite	Chest reach to thigh with 5 kilogram weight

Table 2: degree of strength of muscular adnominal. (Ribosome preparation test)

Measuring strength of paw

In present research vigor paw was measured by diamometer so that the patient takes diameter in one of her hand

In a such way that hand hangs by tight along arms direction patient represent her vigor maximum by entering pressure and without shaking diameter ,the patient repeats the movement 3 times and was recorded the best performance.

The method of doing exercise:

Actually exercising course was 25 sessions that in first session was represented explanations to patient about Pilates exercising and way of doing exercise during 8 weeks. This exercise

The time between exercising was 40 to 6 minutes that including warm up, main exercise and cool down.

For preventing of increasing of central heat and tiredness the exercise was done 5 minutes courses and taking rest between every course. The temperature of hall Exercising was controlled between ranges of 23 to 25 centigrade.

For controlling severity of exercising, Pilates was determinedIn 4 level in such way the exercising begin in level 4 and with recovery of patient operation in weeks 3 to level 3 and in 2 final weeks was used some level 2 exercising.

Planning for severity, the extent of this exercising was accomplished based on previous research and advice related to MS patient[20,21].

Week	exerting	rest	Exerting turns	breathing	Auxiliary device	Exerting level
First and second	50min	1to1	1 t0 &8	shallow	Elastic bands exerting	Level 1
Third and forth	50min	1to 2	1 t0 & 8	deep	Big sporty iatric balls Stick. elastic band Exerting , small balls	0/60 level 0.40 level 2
Fifth to eight	60 min	delectation	8&3	Deep and long	Big sporty iatric ball .stick .elastic/ band exercising small balls and step	0/70 level 1 0/3 level3

Controlling group:

In controlling group, researcher did not have any interference relation to sport activity and they had not asked Participate in any sport activates and used medical therapy under supervision curative doctor.

Statistical method:

For analyzing being natural of data was used klomogrof- Smirnoff test and for studying

homogeneous variances was used loin test ,for studying change, studied variable was utilized of independent T test. Tototally of statistical operation was done with using of soft war spss 22 in level a 2 op 5

Research finding:

In table 3 Demagrafic characteristics of testees were represented in separation of groups.

Table 3: testee S' descriptive characteristics

group	number	age	Index of mass body	EDSS
Pilates exercising	15		26/32 ± 3/88	1/58 ± 0/71
control	15		30/65 ± 3/82	1/58 ± 0/85

The result of dependent T test demonstrated That after 8 weeks was observed significant increase in stamina and strength of abdominal muscles and scapula and strength of paw muscular in participatory group Pilates exercising (p< 0/05) but was *n*' t observed meaning *** change in control group

Table3: results of depend t-test for comparison of pretest compared posttest

variables	Group	Pre test	Post test	t	P
Stamina of abdominal muscular	Pilates exercising	8.78 ± 3.64	11.06 ± 3.84	-4.466	0.000
	Control	8.42 ± 4.19	8/00 ± 4.24	1.101	0.295
Strength of abdominal muscular	Pilates exercising	1.44 ± 0.78	2/06 ± 0.94	-4.267	0.001
	Control	1.58 ± 1.00	1/42 ± 0.90	1.483	0.166
Stamina of scapula	Pilates exercising	0.67 ± 0.69	0.61 ± 0.70	0.325	0.749
	Control	0.58 ± 0/79	0.58 ± 0.52	0.000	1.000
Strength of scapula	Pilates exercising	24.61 ± 4.83	28.00 ± 4.04	-4.804	0.000
	Control	24.67 ± 3.82	24.50 ± 3.85	0.217	0.832
Strength of Paw	Pilates exercising	42.56 ± 6.19	50.000 ± 6.83	-7.776	0.000
	Control	38.58 ± 7.22	38.42 ± 7.12	0.164	0.872

In surveying inner change of group the result of dependent T test (table t) demonstrated that significant difference was observed in change developed in stamina and strength muscular abdominal and scapula strength and strength of paw but was not obsreved expressive difference in stamina scapula.

Table 4: results independent t-test for comparison of change between groups

variable	Group	Pretest-posttest	t	P
Stamina of abdominal muscular	Pilates exercise	2.28 ± 2.16	4.424	0/000
	control	-0.42 ± 1.31		
Strength of abdominal muscular	Pilates exercise	0.61 ± 0.61	-3.307	0.003
	Control	-0.17 ± 0.39		
Stamina scapular	Pilates exercise	0.06 ± 0.73	0.192	0.849
	Control	0.00 ± 0.85		
S Strength scapular	Pilates exercise	3.39 ± 2.99	3.329	0.002
	Control	-0.17 ± 2.68		
Strength Paw	Pilates exercise	7.44 ± 4.06	5.298	0.000
	Control	-0.17 ± 3.52		

DISCUSSION AND DEDUCTION:

The present result of research demonstrate That 8 weeks Pilates exercising recover strength of muscle abdominal and scapula and paw That it was harmonic with Romberg and his colleagues[11] medina and coworkers[12] and kirkgard[13]and colleagues[14] , Moriah et al[15]. and Colkogondo and colleague's findings Those who reported significant increase in muscular might after encasing period.

Development of vigor includes coordinated operation of several processes. Actually capability of producing minimum strength was attributed to neural system and muscular system too.

Developed adaption that produced in result of increasing maximum strength includes neural adaption.

Neural adaption as increasing motivation in dynamic units, applying dynamic units in coincident muscle, provocation dynamical units with further sequence.

Spontaneous restrain and skill increasing and neural – muscular coordination in doing movements and adaptation muscular such as increasing in level of cross section of muscle and change in muscular structure and metabolically adaption[22,23].

In beginning levels, 6 to 8 primary weeks neural adaption of mechanism are dominant increasing strength but in later levels (12 to 26 weeks) acquiring strength was attributed to gradual increasing in size of miofibriles[22,24].

To considering in this research duration of exercising was 8 weeks, it seems that increasing muscular strength in abdominal muscular, scapula and muscular paw is result of muscular neural coordination.

On The subject of The effect of exercising on muscular stamina of upper muscular wasn't observed significant change in muscular scapula That it was equal with medina 's findings and her colleagues That in 12 resistive exercising didnot report expressive change in muscular endurance[12] but Romberg and his coworkers[11] after 6 month aerobic and mighty exercising reported significant increasing in endurance of upper muscular That it is not

similar to result of this research .It sounds The reason of disagreement is because of variation in exercising method In two research. Its Probably for increasing in muscular endurance requires to exercises that are more severe or in longer term. Also in Romberg 's research and his colleagues was used of aerobic and resistive, it 'S likely for recovery of muscular endurance of muscular scapula need to adding resistive exercising or changing movements to using of more heavily balls. But conclusion demonstrated that Pilates exercising makes significant increasing of endurance of muscular waist.

Regarding the role of muscular waist in firmness and preserving balance[25,26], can say that exercising Pilates with increasing strength a muscular waist can be influence of balance of M.S patient[27] and have effective role on decreasing risk of falling and other injures in these patient.

In total result of present research show the role of Pilates exercising in increasing strength and muscular stamina in M.S patient. regarding M.S patients because of side effect .and injuries of neural cells have muscular weakness and on the other part because of lack mobility increase muscle weakness need to exercising interference for preservation muscular operation and recovery strength and patient who effect by M.S can use of Pilates exercising for preservation and increasing strength and stamina of muscles. This research is due to the student's proposal Shiva Shahrokhiyan studding master of science in physical education at shahidchamron university in the city of Ahvaz.

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