

Comparison of isometric and Pilates exercises on Knee pain and quality of life in women with Knee Osteoarthritis

Marziye Taleb Najafabadi¹, Reza Mahdavinejad², Gholam ali Ghasemi³

1-Master of Physical Education and sports science, Islamic Azad University , Borujerd branch, Borujerd, Iran

2-Assistant Professor, Department of Sport Injury and Corrective Exercises, School of Physical Education and Sport Sciences, University of Isfahan, Isfahan, Iran

3-Assistant Professor, Department of Sport Injury and Corrective Exercises, School of Physical Education and Sport Sciences, University of Isfahan, Isfahan, Iran

Abstract

Knee is the largest and the most complicated joint in your body that in addition to being moving has a kind of stability role .Since it is exposed to direct hits it is mostly peculiar to the outbreak of osteoarthritis. Excess use of the knee and its repeated injuries leads to the weakness of the knee and it also causes the reduction of the power of Quadriceps femur muscle. For this reason the knee is the most problem part of the body for spread of this disease. Strengthening the Quadriceps femur muscle plays an important part in prevention and improvement of knee osteoarthritis. The purpose of this study was to compare the effect of isometric and Pilates exercise on pain and physical and mental aspects of quality of life in women 40 to 65 years with knee osteoarthritis.

Methods

40 female patients with knee osteoarthritis were selected randomly and divided into two groups. Pilates exercise, (n=20, mean age $54/8 \pm 7/1$ years, height $159/8 \pm 6/4$ cm and weight $67/1 \pm 14/7$ kg) and isometric exercise (n=20, mean age $56 \pm 5/2$ years, height $161/25 \pm 7/5$ cm weight $70/15 \pm 9/7$ kg) were used . Before beginning an exercise, the pain visual scales (vas) were used . For physical and mental aspects of quality of life questionnaire SF36 was used. Both exercises groups were executed for 8 weeks, 3 times per week and each session 1 hour. After 8 weeks training, both groups were assessed. Statistical analysis using analysis of covariance, significant at $P < 0/05$ was performed.

Results

The results showed that in both Pilates and isometric group's decreased pain and as well as improving the physical and mental aspects of quality of life. There is no significant difference between both methods of training as well as the size of the improvement disease in patients with osteoarthritis of the knee joint.

Conclusion

Both methods reduce the negative effects of knee osteoarthritis and both exercises can reduce pain and also improved quality of life.

Keywords Isometric exercises, Pilates exercises, knee osteoarthritis, pain, quality of life

Introduction

The knee is the largest and most complex joint of the body, In addition to the mobility, stability role as well. Knee is exposed to direct impact and support weight so the highest prevalence of osteoarthritis (OA) is allocated (Flugsrud, et al.). Knee osteoarthritis is a degenerative and progressive disease of the cartilage in the joints (Chung wei C. et.al). Patients with osteoarthritis of the knee due to a series of clinical symptoms such as pain in the knee , stiffness , swelling , decreased range of motion , joint instability and sometimes deformity , loss of self esteem, decreased activity , loss of balance and will ultimately reduce the quality of life (Egan A. and Menten J.). The World Health Organization defines quality of life, perception of their position in life, in terms of culture, value systems in which they live is, goals,

expectations, standards, and their priority (Bonomi A.E. et.al). Major risk factors for osteoarthritis are increasing age, muscle weakness; especially weakness of the quadriceps muscles has an important role in knee osteoarthritis. In people with knee osteoarthritis, disability associated with quadriceps muscle weakness or joint pain and its correlation with the severity of radiographic changes (Montazeri, M., privacy Ali). A higher percentage of women than men are totally include osteoarthritis (Messire sp.), (Mousavi). Also, genetics, trauma, severe and repeated use of the joint (Ahmed Kamran.), overweight and sedentary (Messire sp.) are subsequent risk factors for developing osteoarthritis. The two factors, lack of exercise and excess weight can be controlled (Egan A., Menten J). In recent years, in addition to routine therapy and drug therapy, conservative treatments such as physiotherapy and acupuncture devices had

used. (Thomas A.). the goal of treatment in osteoarthritis is decrease pain, and maintains joint mobility (Sharma L. Kapoor D). To control the high prevalence of knee osteoarthritis symptoms, needed to introduce less expensive and less complicated way to deal with this disease. This study was based on two types of training methods and try to suggest and treatment a good method to reducing time, cost and increase the quality of life for these patients.

Materials and Methods

This study was a prospective, quasi-experimental, and design using pre-test and post-test. Subjects purposefully included 40 women with knee osteoarthritis who were aged between 40 to 65 years between women with knee osteoarthritis in Najaf Abad city and randomly assigned in to 2 groups of isometric and Pilates exercise.

Female, with knee osteoarthritis was provided by the specialist medical records and radiology images of the knee and had no history of knee surgery, hypertension.

Independent variables was isometric and Pilates exercises and the results on the dependent variable such as pain, and physical and mental aspects of quality of life were assessed. First, to assess the physical condition to participate in the training of volunteers, a demographic questionnaire sheet was used. Then they were given a consent form and approval of the physician who consents and approvals self-care by physicians and the medical documentation completed. The pain variable was measured by using VAS method (Visual Analog Scale). Quality of life index samples were studied by short questionnaire SF36. After completing the relevant forms and record the test, two groups (Pilates and Isometric exercise) were began their

training for 8 weeks, 3 times per week for 60 minutes. Exercises were designed in such a way that women with a back pain could execute it comfortably and adjustable if needed. Also, all exercise progressively harder and were. focused on strengthening the quadriceps and hamstrings. The duration of each Pilates exercise session was total an hour includes 10 minutes as warm up, 40 minutes of Pilates exercise and 10 minutes as cooling. Pilates exercise protocol was containing postural training, relaxation, stretching, balance, breath and strength training. The standing exercises using wood or wall for balance, and then conducted exercises in sitting and sleeping. In the isometric exercise protocol, each session was executed totally one hour included 10 minutes warm up, 40 minute isometric training and 10 minute cool-down.

Results

40 women with knee osteoarthritis were randomly divided into two groups according to Tables 1.

According to Table 2, the pre-test and post-test scores for pain (vas) and physical quality of life in women with osteoarthritis of the knee were indicated difference between quality of life and psychological dimension ,it seems that subjects was executed exercise seriously in Pilates classes.

According to Table 3, the pre-test and post-test scores for pain (vas), physical and mental quality of life in women with osteoarthritis of the knee after doing isometric exercises are highly significant.

According to Table 2 and 3 there was no significant difference between the scores of both isometric and Pilates exercises and degree of improvement in pain as well as mental and physical quality of life in patients with osteoarthritis of the knee were equal.

Table 1: Characteristics of participants

Weight (kg)	Height (cm)	Age (years)	Group
67/1±14/7	159/8±6/4	54/8± 7/1	Pilates
70/15±9/7	161/25±7/5	56±5/2	Isometric

Table 2: The effect of Pilates on pain and physical and mental aspects of quality of life

p	t	SD	Mean	Group	Variables
0/011	2/812	1/50	5/80	pre-test	Pain
		1/63	4/60	post-test	
0/022	-2/499	13/57	53/12	pre-test	Psychological dimension of quality of life
		14/22	61/43	post-test	
0/005	-3/151	14/93	37/41	pre-test	Physical dimension of quality of life
		17/95	49/77	post-test	

Table3: Effect of isometric exercise on pain and physical and mental aspects of quality of life

p	t	SD	Mean	Group	Variables
0/001	4/467	1/59	5/70	pre-test	Pain
		1/82	4/45	post-test	
0/584	-0/556	14/79	61/99	pre-test	Psychological dimension of quality of life
		12/69	63/21	post-test	
0/039	-2/217	13/94	45/80	pre-test	Physical dimension of quality of life
		11/13	52/49	post-test	

Discussion

The results of this study was same with the results of the Barati and colleagues (Barati, S. et.al), Mehrabian and colleagues (Mehrabian, H. et.al), (Thorp et al) with the effects of physical exercise in reducing pain in patients with osteoarthritis of the knee , Asadi and colleagues (Sled elizabeth) , Chang and colleagues (Chang JT et.al.) . Also. Ahadi et al (Ahadi, t. Salek, et.al), Hadian and colleagues (Hadi, MR.) , Igor and colleagues (Eyigor S. et.al.), to determine the effect of exercise on the physical performance of quality of life in women has done and found , the program

improves physical performance , increase muscle strength and improve the quality of life.

Conclusions

The purpose of this study was to compare the effect of isometric exercise and Pilates on knee pain and physical and mental aspects of quality of life in women with knee osteoarthritis 40 to 65 years. Two types of training methods used in patients with osteoarthritis of the knee.

Result shows that both Pilates and Isometric exercise can be able to improve knee pain and also improve mental and physical aspect of quality of life.

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