EFFECTIVENESS OF EXERCISE TO BODY MASS INDEX IN OSTEO ARTHRITIS PATIENTS SEEKING PHYSIOTHERAPY IN HABIB PHYSIOTHERAPY COMPLEX PESHAWAR

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ABSTRACT

Objective: To compare effectiveness of exercise to body mass index, in osteoarthritis patients seeking physiotherapy in Habib Physiotherapy Complex Peshawar.

Material and Method: The study was conducted in Habib Physiotherapy complex Peshawar from July 2013 to July 2014. The study population included 200 females patients 45–75 years of age diagnosed with knee osteoarthritis. According to body mass index the patients were divided in two groups, in group 1 normal and overweight (BMI18.5-24.9KG/M2) and group 2 obese (BMI>25kg/m2) were included. The effectiveness of the exercise was measured in three dimensions: muscle strength, joint range and pain.

Results: In our study patient's pain, strength and flexion extension was checked after performing isotonic exercises for 8 weeks. Pain was similar in both groups 1 and 2(BMI18.5-24.9KG/M2)(BMI>25KG/M2) at baseline and at 4 weeks. There was a statistically significant difference (P=.01) performed at 8 weeks within the group 1(BMI 18.5-24.9KG/M2). In our study Strength analysis the percentage of patients in the group1 (BMI 18.5-24KG/M2) was higher (33.3%) than the percentage of patients in the group2 (BMI>25KG/M2) (15.2%).The flexion extension checked after 8 weeks. In both groups, group1 (BMI 18.5-24KG/M2) reached 100.0%, while the group 2 reported (BMI>25KG/M2) 97.0%..

Conclusions: In conclusion, this study suggests that isotonicc exercises are more effective for gaining strength, mobility and relieving pain in patients with knee osteoarthritis in normal and overweight patients compared to obese. However, it is necessary to understand that the differences found in this study are small, and there is a need for other studies with randomized designs and larger sample sizes to confirm these results.

Key Words: Osteoarthritis, obesity.

INTRODUCTION:

Obesity and Osteoarthritis are inextricably linked and must therefore be addressed together.[1] Physical activity is key to reducing the risk of developing both, as well as countless other related diseases, such as diabetes, heart disease, hypertension and stroke[2].In united states,27 million people suffer from osteo arthritis, the most common type of arthritis in this country is most common type affects more women than man [3] . Being overweight strains the knees. In fact, for every pound an individual gains, the knees are forced to endure an extra three pounds of pressure. This same amount of weight gain produces six times the pressure on the hips.[4]

Because physiotherapists are highly skilled in exercise prescription, they can play a key role in the design, delivery and implementation of exercise programs for the management of these disorders. It also seems counterintuitive that exercise can benefit a condition that is marked by the wearing away of cartilage.[5] Yet, studies have shown that exercise can help people with arthritis control and reduce pain as well as improve general function. Exercise may delay or even prevent disability in people with arthritis.[6-7] Although the management of obesity is a very important and controversial topic in today's society and there is evidence which point to fact that the physiotherapist may have a crucial role in the fight against an increasing obese population the evidence base in this area is significantly lacking. In this article the effectiveness of the exercise is correlated to body mass index in female osteoarthritis patients.

MATERIAL AND METHOD:

This is an experimental study conducted at the Habib Physiotherapy Complex Peshawar. The data were retrieved from record register of HPC (Indoor and Outdoor patients) recording their presenting complains and known diagnoses. Data was collected on structure grid. The study population included 200 females patients 45–75 years of age diagnosed with knee osteoarthritis, established according to the radiographic classification of Kellgren-Lawrence (grades I, II and III)[8].

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The intervention lasted eight weeks and the physical activity was carried out every second day. The statistical analysis included averages, standard deviation, percentage, χ^2 test, z test for two populations, t test for two independent populations.

The study included patients with a body mass index less than or equal to 39.9, with limitation for flexion and extension, muscle strength of 3–5 according to the Lovett scale and who signed informed consent. Those excluded were diagnosed with scheduled or performed knee arthroplasty, a lower extremity fracture of less than one year, drug treatment other than paracetamol and those with neurological and heart diseases that contraindicated exercise.

Patients with rheumatoid arthritis and knee injury suffered outside the exercise program were also excluded. The socio demographic variables studied included weight, height, age, and body mass index. Participants of the study were divided on the bases of body mass index, for Asians the normal body mass index is from 18.5 to 22.9kg/m^2, body mass index considered overweight is from 23 to 24.9 kg/m^2 and obesity is considered when body mass index >25 kg/m^2.[9] According to body mass index the patients were divided in two groups, in group 1 normal and overweight (BMI18.5-24.9KG/M^2) and group 2 obese (BMI>25kg/m^2) were included. The effectiveness of exercise was measured in three dimensions: muscle strength, joint range and pain.

- Muscle strength was assessed with the Lovett scale which includes the categories zero, trace, poor, fair, good and normal.[10]
- The joint range was evaluated in relation to flexion and extension according to the degrees of mobility,[11] determined by a goniometer and included the following categories:

  Flexion:

  - Grade 0 (greater than or equal to 110°=normal).
  - Grade I (more than 90° but less than 110°=mild).
  - Grade II (more than 60° but less than 90°=moderate).
  - Grade III (more than 30° but less than 60°=severe).
  - Grade IV (less than 30°=very severe).

  Extension:

  - Grade 0 (from 0° to −5°).
  - Grade I (any degree of limitation from −6°).
- Pain was measured with the Index of Western Ontario and McMaster Universities (WOMAC)[12] which includes a scale of 0–4, considering 0 as no pain and 4 as very severe pain. The evaluation includes 5 questions so the minimum value corresponds to 0 and the maximum to 20.
  - 0=no pain
  - 1=mild pain
  - 2=moderate pain
  - 3=severe pain
  - 4=very severe pain

The intervention lasted eight weeks and physical activity was performed every second day in both groups.

The experimental groups1 and 2 performed isotonic exercises.

a. The activity took place every other day with sessions lasting 40min.

b. The program included bicycling for 10min periods with 5min of rest.

c. The position of the seat is raised as high as possible for less knee flexion.

d. The resistance was gradually increased, starting with one kg and increasing 350g per week up to 3kg. One of the instruments used in the study is the WOMAC index, used to assess pain, as they are based on the patient's subjective perception. To evaluate stiffness, a goniometer was used for degrees of flexion and extension, as a more objective measure of joint mobility.

e. Incredibraces was used for patients experiencing pain

Data was analyzed using SPSS version 15

RESULTS:

In the experimental group there were females, average age 58.00 years, weight 66.03kg, 153.63 cm height and body mass index of 28.00 were included.

Table 1 shows the pain was similar in both groups 1 and 2(BMI18.5-24.9KG/M^2)(BMI>25KG/M^2) at baseline and at 4 weeks and in the third measurement, performed at 8 weeks, there was a statistically significant difference (P=.01). A comparison of pain within the group 1 BMI 18.5-24.9KG/M^2 demonstrated a statistically significant decrease from week 4.

(Table 2). The baseline strength was similar in both groups (P=.28), this similarity was maintained in the evaluation at 4 (P=.36) and 8 weeks (P=.16) However, it increased over time in both groups. At baseline, in the category of normal strength, there were no patients and at 8 weeks, the group1 (BMI 18.5-24KG/M^2) group 33.3% reported normal strength and the

Table 1: Comparison of Pain between group1 (BMI 18.5-24.9KG/M2)and group 2 (BMI>25KG/M2) at Baseline, 4 and 8 Weeks from the Intervention.

Comparison Between Groups						
Evaluation	**Group -1 (BMI 18.5-24.9KG/M2)**		**Group-2 (BMI>25KG/M2)**		**T**	**P**
	Mean	Standard Deviation	Mean	Standard Deviation		
Basal	11.54	3.43	10.15	4.20	1.42	.15
4 weeks	8.56	3.33	9.09	4.39	0.53	.59
8 weeks	5.50	2.18	7.48	3.78	2.52	.01

Comparison in the Exercise Groups								
Category	**Group-1 (BMI 18.5-24.9KG/M2)**				**Group-2 (BMI>25KG/M2)**			
	Mean		T test	P	Mean		T test	P
Baseline vs 4 weeks	11.53	8.57	6.51	.00	10.15	9.09	2.03	.05
4 weeks vs 8 weeks	8.57	5.50	9.69	.00	9.09	7.48	4.56	.00
Baseline vs 8 weeks	11.53	5.50	5.46	.00	10.15	7.48	5.85	.00

T test for two independent populations. T test for paired populations. Mean is estimated on a scale from 0 to 20

Table 2: Comparison of Strength between Group 1(BMI 18.5-24KG/M2) Group 2 (BMI>25KG/M2) at Baseline, 4 and 8 Weeks from the Intervention.

Comparison Between Groups				
Category		**Percentage**	**χ2**	**P**
		(BMI 18.5-24KG/M2)	(BMI>25KG/M2)	
Baseline evaluation				
Regular	43.3	30.3	1.51	.28
Good	56.7	69.7		
Normal	0.0	0.0		
Evaluation at 4 weeks				
Regular	33.3	27.3	2.01	.36
Good	66.7	66.7		
Normal	0.0	6.1		
Evaluation at 8 weeks				
Regular	0.0	3.0	3.57	.16
good	66.7	81.9		
Normal	33.3	15.2		

group2 (BMI>25KG/M^2) group 15.2% also reported normal strength.

In both groups, more than 80% of patients were placed in Grade I at baseline; group1 reached 100.0% at 8 weeks, while the group 2 reported 97.0%. However, in the three assessments (baseline, 4 weeks and 8 weeks) there were no statistically significant differences (P>.05). In extension, the assessment at 8 weeks in group 1, 70.0% was found in the normal category and 60.6% in the group 2, also ranking in this group (P=.43).

DISCUSSION:

Osteoarthritis is a chronic joint disease; isotonic exercise leads to the development of mechanical work [13].Our study was conducted on females[14]; average age 58.00 years[15], weight 66.03kg, 153.63 cm height and body mass index of 28.00 were included. The purpose of exercise to ensure stability and progress of the lower extremities in the literature is reported in groups of patients undergoing rehabilitation, with improvement occurring after 4 weeks of starting the program. This behavior was also found for muscle strength and pain in the study when the analysis was performed within each group of exercises. However, the study aimed to find the difference between groups at 8 weeks into the program. What we can comment on this is that the isotonic exercise program is an option for the management of patients with osteoarthritis of the knee, which coincides with reports in the literature.[16], [17, 18,]

In our study patient's pain, strength and flexion extension was checked after performing isotonic exercises for 8 weeks. Pain was similar in both groups 1 and 2(BMI18.5-24.9KG/M^2)(BMI>25KG/M^2) at baseline and at 4 weeks. There was a statistically significant difference (P=.01) performed at 8 weeks. Within the group 1(BMI 18.5-24.9KG/M^2). In our study Strength analysis the percentage of patients in the group1 (BMI 18.5-24KG/M^2) was higher (33.3%) than the percentage of patients in the group2 (BMI>25KG/M2) (15.2%).The

Table 3: Comparison of the Joint Range in Flexion and Extension Between Group 1 and Group2 at Baseline, 4 and 8 Weeks From the Intervention.

Category	Percentage		χ2	P
	(Group1)	(Group2)		
Flexion Baseline evaluation				
Grade I. Mild (90–110)	83.3	87.9	0.26	60
Grade II. Moderate (60–89)	16.7	12.2		
Evaluation at 4 weeks				
Grade I. Mild (90–110)	93.3	93.9	0.01	.92
Grade II. Moderate (60–89)	6.7	6.1		
Evaluation at 8 weeks				
Grade I. Mild (90–110)	100.0	97.0	0.92	.33
Grade II. Moderate (60–89)	0.0	3.0		
Extension Baseline evaluation				
Normal (0–5°)	33.3	45.5	0.96	.32
With alteration (6–15°)	66.7	54.5		
Evaluation at 4 weeks				
Normal (0–5°)	40.0	51.5	0.83	.36
With alteration (6–15°)	60.0	48.5		
Evaluation at 8 weeks				
Normal (0–5°)	70.0	60.6	0.61	.43
With alteration (6–15°)	30.0	39.4		

flexion extension checked after 8 weeks In both groups, group1 (BMI 18.5-24KG/M^2) reached 100.0%, while the group 2 reported (BMI>25KG/M^2) 97.0%. which coincides with reports in the literature[13]

Exercise improves flexibility, promotes movement, and increases blood flow to the area. It also helps to reduce pain.[19] Strengthening exercise is important to restore function and condition to weak muscles. Most people decreased flexibility is a normal sign of aging.[20] For others it may be the result of illness, injury or being overweight.[21] Being able to move one's joints through a complete range of motion is something that is too often taken for granted or ignored as a part of physical fitness.[22] However, in most cases it is not too late. Physiotherapy can help regain or improve flexibility which improves performance and decreases risk of injury, improves posture, reduces muscle soreness, improves muscle coordination [23]

CONCLUSION:

This study suggests that isotonic exercises are more effective for gaining strength,mobility and relieving pain in patients with knee osteoarthritis in normal and overweight patients as compare to obese. However, it is necessary to understand that the differences found in this study are small, and there is a need for other studies with randomized designs and larger sample sizes to confirm these results.

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