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A Training Program Using the Martial Art Method to Improve the Condition of the Knee Joint

Essam Abdelfatah[1*], Mohamed Nabil Ahmed[2]
[1] *College of Physical Education, Minia University, Egypt*
[2] *College of Physical Education, BeniSuef University, Egypt*

Abstract:
Background: *Sports Activities are thought to be essential component of a healthy society. Skilled and recreational sports competitions currently come to be more difficult due to expanded number of sport events each year. This expanded physical requirement makes players susceptible to musculoskeletal harms. Knee injury is the most frequently affected injuries as in all sports injuries.Consequently, balance training, muscle-improving exercises, and physical physiotherapy are utilized to improve the strength of the joints.* ***Aim:****to determine the effect of training on the condition of the knee joint by applying a training program using the Taiji method as one of the methods of kung fu sport.* ***Methods****: the study design was experimental design of the two groups, one is experimental and the other is control by means of (pre - post) test. Data was gathered at baseline and following completion of 10 meetings of training sessions to examine the differences in personal knee assessment scores. The research sample was chosen intentionally from those with knee roughness from Samalot Sports Club. The sample size was 10 previously injured, randomly divided into (5) infected individuals representing the experimental research sample or the study group to perform the training program with them, and (5) injured individuals representing a control group sample.* ***Results:****there are statistically significant differences between the pre and post measurements of the experimental group in the muscle strength of the muscles working on the knee joint (contraction- relaxation), and in the muscular circumference of the muscles above the knee (at a distance of 5 cm - at a distance of 10 cm), and in the degree of pain sensation at Significance level 0.05.While there are no statistically significant differences between the pre and post measurement of the experimental group in reducing weight at the level of significance of 0.05.* ***Conclusion:*** *Knee damages are widespread in sports. The organized exercise program improved muscle strength and activity increases as shown in the healthier operation of specific tasks.*

Keywords: *Athletes, Balance training, Knee pain*

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I. Introduction:

Sports Activities are thought to be essentialcomponent of a healthy society. Skilled and recreationalsports competitionscurrentlycome to be more difficult due to expanded number of sport events each year. This expanded physical requirementmakesplayerssusceptible to musculoskeletal harms(Sward L, 1992).

Recently, fartherindividualsjoin in sport events for relaxation, take the lead to rise in sport-associated injuries. The commonlyinjuredpart of the body is a lower limb, estimating for nearly 77% of all damages. In particular, injury to the knee joints (Lynch S, 2002).

Knee injury is the most frequentlyaffected injuries as in all sports injuries, theproportion of knee damage is around 15–50% (Loes M, 2000). Frequency of knee hurts is 1 per 1000 in sports events that do includequick cutting and stopping actions (Agel J, 2007).

Consequently, balance training, muscle-improving exercises, and physicalphysiotherapy are utilized to improve the strength of the joints (Mattacola C, 2002).

Balance exerciserises the steadiness of knee and ankle joints, and directing ankle joints over knee joint flexion and can also purposefullycounteract for damaged muscle strength (Morrison K, 2007, Lee D, 2013).

Several studies have been performed on the usefulness of isokinetic dynamometry to evaluatepowerful of muscles strength and impacts of exercise on bodilyfunctioning and posture, in patients, as well as healthy persons. A number of studies have statedconsiderableprogress in muscle forcemakingcompared with non-exercisers (Nickols RSM, 2007, de Amorim AM, 2006).

The research aims to determine the effect of training on the condition of the knee joint by applying a training program using the Taiji method as one of the methods of kung fu sport.

II. Research hypotheses- :

1 -There are statistically significant differences between the pre and post measurements in the muscle strength of the muscles working on the knee joint (holding - extensor) of the experimental sample in favor of post measurements.

2 -There are statistically significant differences between the pre and post measurements in the muscle circumference of the muscles above the knee (5 cm away - 10 cm away) for the experimental sample in favor of the post measurements.

3 -There are statistically significant differences between the pre and post measurements in the degree of pain sensation of the experimental sample in favor of the post measurements.

4- There are statistically significant differences between the pre and post measurements in reducing the extra weight of the experimental sample in favor of the post measurements.

III. Materials and Methods

To achieve the goal of the research and to verify the validity of its hypotheses, the investigatorutilized the experimental design of the two groups, one is experimental and the other is control by means of (pre - post) test.

The International Knee Documentation Committee (IKDC) 2000 Subjective Knee assessmentwas used to evaluate the indicators, sports movements, and role of athletes. Data was gathered at baseline and followingcompletion of 10 meetings of training sessions to examine the differences in personal knee assessment scores.

Pilot Study: The researcher conducted the exploratory experiment on a sample of oneparticipant from the research community and outside the original sample, during the period from 15/6/2015 to 6/22/2015

The research sample: -

The research sample was chosen intentionally from those with knee roughness from Samalot Sports Club. The sample size was 10 previously injured, randomly divided into (5) infected individuals representing the experimental research sample or the study group to perform the training program with them, and (5) injured individuals representing a control group sample.

Conditions for selecting a sample "inclusion criteria":

Having one knee affected.

To be male and have a personal desire to carry out the experiment.

Consistency in program implementation throughout the period of research.

Research tools and devices: -

The researcher used the following tools and devices to collect data in proportion to the nature of the study and the data to be obtained as follows:

1- The Densometer device for measuring the muscle strength of the muscles working on the knee joint.
2- A tape measure to measure the muscular circumference of the muscles above the knee.
3- A visual analogy scale to measure the degree of pain.
4- International Knee Documentation Committee (IKDC)Subjective Knee evaluation.
5- A medical scale for measuring weight.

Equality between control and experimental group: The researcher has made parity between the two research groups in the following variables: -

Age - height.

Muscle strength of the muscles operating on the knee joint (holding - extensor).

Muscle circumference of the muscles above the knee (5 cm away - 10 cm away).

The degree of pain sensation for the affected knee.

Table (1): An indication of the differences between the experimental and control groups in the variables (Age - Height) under investigation (N1 + N2 = 10)

Variables	Unit	Control Group		Experimental Group		T test	Significance
		Mean	St. Dev	Mean	St. Dev		
Age	Years	49.2	3.115	49	4	0.088	Non sig
Height	Cm	172.4	2.074	171.8	1.94	0.474	

(T) value at 0.05 = 1.86

It is clear from the previous table that: Absence of statistically significant differences between the experimental and control groups in the variables (age, height), which indicates the equivalence of the two groups.

Table (2): An indication of the differences between the experimental and control groups in the variables (Muscle strength, muscular circumference of the muscles above the knee, degree of pain, weight) under investigation (n1 + n2 = 10)

Variables		Unit	Control Group		Study Group		T test	Significance
			Mean	St. Dev	Mean	St. Dev		
Muscle strength	Contraction	Degree	4.86	0.472	4.88	0.466	0.067	NOn significant
	Relaxation	Degree	4.78	0.396	4.78	0.39	0.000	
The muscular circumference of the muscles above the knee	5 cm away	Cm	40.8	3.347	40.96	3.104	0.078	
	10 cm away	Cm	45.26	1.653	45.34	1.303	0.085	
Pain Scale		Degree	8.35	0.681	8.6	0.668	0.587	
Weight		Kg	92.24	1.408	91.44	2.432	0.637	

(T) value at 0.05 = 1.86

It is clear from the previous table that: Absence of statistically significant differences between the experimental and control groups in the muscle strength and muscle circumference variables of the muscles above the knee and the degree of pain and weight, which indicates the equivalence of the two groups.

Measurements taking:in which measurements are made for all members of the sample in a unified manner and under the same conditions, and the same tools are used to measure all members of the sample, and the measurement is done in the same order and in a unified sequence.

Training sessions: Duration (9) weeks and the number of training units (3) units per week.

The LoadCycle is (1: 2): the unit time for the maximum load is 45 minutes, the unit time for high load is 35 minutes, and the unit time for the average load is 25 minutes.

IV. Results

Table (3) Differences between pre and post measurements in the muscle strength of the muscles operating on the knee joint of the study group

Variables		Unit	Pre- test		Post-test		T test	Significance
			Mean	St. Dev	Mean	St. Dev		
Muscle strength	Contraction	Degree	4.86	0.472	5.66	0.404	9.562	Sig
	Relaxation	Degree	4.78	0.396	5.6	0.339	4.556	Sig
The muscular circumference of the muscles above the knee	5 cm away	Cm	40.8	3.347	45.3	1.483	2.875	Sig
	10 cm away	Cm	45.26	1.653	48.36	0.611	3.924	Sig
Pain scale		Degree	8.35	0.681	6.82	0.327	5.162	Sig
Weight		Kg	92.24	1.408	91	0.791	1.709	Non sig

(T) value at 0.05 = 2.132

Table (3) shows that, there are statistically significant differences between the pre and post measurements of the experimental group in the muscle strength of the muscles working on the knee joint (contraction- relaxation), and in the muscular circumference of the muscles above the knee (at a distance of 5 cm - at a distance of 10 cm), and in the degree of pain sensation at Significance level 0.05. While,there are no statistically significant differences between the pre and post measurement of the experimental group in reducing weight at the level of significance of 0.05.

V. Discussion

The study results showed that there are statistically significant differences between the pre and post measurements of the experimental group in the muscle strength of the muscles working on the knee joint (contraction- relaxation), and in the muscular circumference of the muscles above the knee (at a distance of 5 cm - at a distance of 10 cm), and in the degree of pain sensation. These results were in the same line with Nam S, 2016 who found that equally the balance out-training and joint exercise groupings had a significant rise in muscle action; nevertheless, in attendance was no statisticallysignificant difference among the groups. The study result is also consistent with prior study of Forestier N, 2005, who realized that physical activity treatment program was significantly successful in enhancing the surrounding muscles of joints and the strength of the joint.

Its in contrast with Hall M, 2017 study who discovered that there were no connectionsamong change in strength and change in physical function in respondents with minor or mildknee physical disfunction at baseline.

The results of this study revealed that there were statistically significant differences between the pre and post measurements of the experimental group in the degree of pain sensation. This result at in the same line with Suzuki Y, 2019 who stated that knee pain and dysfunction were significantly enhanced in the various exercise group; participants of which completed strength exercise of the hip muscles.Additionally, the study of Aguiar G, 2016 who confirmed that the awareness of pain reduced after exercising.

VI. Conclusion

Knee damages are widespread in sports. The organized exercise program improved muscle strength and activity increases as shown in the healthieroperation of specifictasks.

References

[1]. Agel J, Olson DE, Dick R, Arendt EA, Marshall SW, et al. (2007) Descriptive epidemiology of collegiate women's basketball injuries: National Collegiate Athletic Association Injury Surveillance System, 1988-1989 through 2003-2004. J Athl Train 42(2): 202-210.

[2]. Aguiar G, Rocha S, Rezende G, Nascimento M, &Scalzo P. (2016). Effects of resistance training in individuals with knee osteoarthritis. *FisioterapiaemMovimento*, *29*(3), 589-596. https://dx.doi.org/10.1590/1980-5918.029.003.AO17

[3]. de Amorim AM, Leme LE (2006) Isokinetic dynamometry in elderly women undergoing total knee arthroplasty: a comparative study. Clinics (Sao Paulo) 61(3): 215-222.

[4]. Forestier N, Toschi P: The effects of an ankle destabilization device on muscular activity while walking. 2005, 26: 464–470.

[5]. Hall M, Hinman RS, van der Esch M, et al. Is the relationship between increased knee muscle strength and improved physical function following exercise dependent on baseline physical function status?. *Arthritis Res Ther*. 2017;19(1):271. Published 2017 Dec 8. doi:10.1186/s13075-017-1477-8

[6]. Lee DH, Lee SY, Park JS: The effect of fixed ankle and knee joints on postural stability and muscle activity. J PhysTherSci, 2013, 25: 33–36. [CrossRef]

[7]. Loes M, Dahlstedt LJ, Thomee R (2000) A 7-year study on risks and costs of knee injuries in male and female youth participants in 12 sports. Scand J Med Sci Sports 10(2): 90-97.

[8]. Lynch SA: Assessment of the injured ankle in the athlete. J Athl Train, 2002, 37: 406–412. [Medline]

[9]. Mattacola CG, Dwyer MK: Rehabilitation of the ankle after acute sprain or chronic instability. J Athl Train, 2002, 37: 413–429. [Medline]

[10]. Morrison KE, Kaminski TW: Foot characteristics in association with inversion ankle injury. J Athl Train, 2007, 42: 135–142. [Medline]

[11]. Nam S, Kim W, Yun C. Effects of balance training by knee joint motions on muscle activity in adult men with functional ankle instability. The Journal of Physical Therapy Science. J. Phys. Ther. Sci. Vol. 28, No. 5, 2016.

[12]. Nickols RSM, Miller LE, Wootten DF, Ramp WK, Herbert WG (2007) Concentric and eccentric isokinetic resistance training similarly increases muscular strength, fat-free soft tissue mass, and specific bone mineral measurements in young women. OsteoporosInt 18(6): 789-796.

[13]. Suzuki, Y., Iijima, H., Tashiro, Y. *et al.* Home exercise therapy to improve muscle strength and joint flexibility effectively treats pre-radiographic knee OA in community-dwelling elderly: a randomized controlled trial. *ClinRheumatol* **38,** 133–141 (2019). https://doi.org/10.1007/s10067-018-4263-3

[14]. Swärd L (1992) The thoracolumbar spine in young elite athletes. Current concepts on the effects of physical training. Sports Med 13(5): 357-364.

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