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Systematic Directivity for Selecting Special Javelin Throw Exercises

W.A. Al-lami and G.B. Severukhin

Abstract--- *The study aims to identify the impact of special exercises for javelin players. The study was conducted on a sample of the Iraqi national team consisting of (10) players, and the researcher used the experimental method for (10) weeks at (3) training units per week, and the time of the main part of the daily training unit ranged at a rate of (40-60) minutes. The researcher used the statistical treatments in the SPSS statistical program and concluded the following: The special exercises for javelin throw contributed to flexibility of movement and strength of working muscles.*

Keywords--- *Special Exercises, Javelin Throw, Biomechanics Directivity.*

The Most Important Recommendations

- The necessity of making use of this study in developing the range of movement and strengthening the muscles working in the process of javing.

I. INTRODUCTION

The pedagogical process of training athletes in javelin throwing is one of the activities that require careful study and analysis, because it is difficult in terms of technical characteristics that depend on many biomechanical factors. Thanks to their consideration, an athlete can achieve optimal preparedness and high results. The result itself in javelin throwing depends on the manifestation of maximum efforts in a short period of time during the release of the javelin, which is associated with the previous actions: speeding the throwing-projectile system, throwing steps, lance grabbing and final acceleration. The effectiveness of all these actions will be reflected in technical criteria such as speed, angle and height of the spear.

The research problem is that the training process, based on the use of biomechanical and other scientific data, is aimed at achieving the best result. Therefore, when working on improving the technique and improving motor characteristics, trainers should use effective methods of theory and methods of training athletes not only to obtain final results, but also intermediate goals. In the process of mathematical or computer processing of video footage of athletes, the share of the contribution of biomechanical variables to the result was determined. In the process of comparing the films of outstanding javelin throwers and the films of the participants in the experiment, shortcomings in technical training were revealed. Testing data made it possible to find reserves of special physical training. Accounting for all this made it possible to purposefully select the means and methods of the training process that meet the requirements of both physical and technical training.

W.A. Al-lami, Udmurt State University, Institute of Physical Culture and Sports, Izhevsk, Russia. E-mail: waellami@gmail.com
G. B. Severukhin, Udmurt State University, Institute of Physical Culture and Sports, Izhevsk, Russia.

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Research Problem

Scientific development and the renewal of training tools made the athlete subject to training at specific points, and thus the effort became concentrated on one part and not another, which has a negative effect in increasing the body burden on the untrained parts or on which I focus on performing exercise. Exercising regularly and with a non-coded workout can lead to an injury. Also, the trainers neglect the importance of technique and the distinct flexibility of the joints and the flexibility of the muscles, and in this regard we mean the extent of interest in setting up a special program to develop the technique and your lies developing the dynamic range of the joints, and strengthening the muscles of the limbs in a manner consistent with the requirements of effective performance of skills.

The research problem lies in the lack of attention of the trainers and the lack of training curricula based on the studied and studied scientific foundations in addition to the lack of specialized technical cadres with sufficient experience as well as advanced modern tools and devices that contribute to developing the outputs of the activity of the muscles of work, especially in the technique that is the basis of throwing skill Spear, so the researchers saw the setting up of a set of exercises to develop technique, angles, and special speed as well as muscle strength and thus increase achievement for players throwing spear for the Iraqi national team.

Research Objectives

1. Determine the results of a biomechanical analysis of Iraqi athletes by javelin throwing team.
2. Determine the level of technical and special physical fitness of participants in biomechanical analysis.
3. To develop, in accordance with the biomechanical analysis data, a promising model for the training of javelin throwers in the Iraqi counterpart.
4. To determine the effect of special physical exercises on the contribution of the biomechanical characteristics of the model to the javelin throw of the Iraqi team.

Research Hypotheses

1. There is an effect of special exercises prepared by the researcher on the technique of javelin effectiveness.
2. There are statistically significant differences in increasing the range of movement and working muscles of the javelin players and in favor of dimensional tests.
3. There are statistically significant differences in increasing the range of movement, muscles of work and technique for javelin players and in favor of the experimental group.

Research Domains

1. The humanitarian field: The research sample included (8) players from the Iraqi national team.
2. Time domain: for the period from 20/01/2019 to 30/03/2019.
3. The spatial field: the stadiums of the College of Physical Education / University of Baghdad - stadiums of the College of Physical Education / University of Qadisiyah - biomechanical laboratory in the College of

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II. FIELD RESEARCH PROCEDURES RESEARCH METHODOLOGY

The researcher used the experimental method using the equivalence groups method, as it suits the nature of procedures search.

Field research procedures

Community and Research Sample

Was selected 4 players were intentionally chosen from the research community consisting of 8 players from the Iraqi national team team. Homogeneity was conducted between the sample, where the sample was divided into the experimental group (4) and the control sample (4) players. The researcher relied on the system of attempts to throw the javelin as calculated Every three attempts by a player, meaning that each player represents two people, as the total has become the total sample (16) players as shown in Table (1).

Table 1: Shows the Mean, Standard Deviation, Mean, and Torsion Value for Homogenization of the Sample

Variables	χ2	σ	P
Length	128	4.8	0.876
Weight	82	2.400	-0.655
Age	88	0.7	0.432
Training age	8.7	0.8	0.399

The table above shows that the torsion value was between (1 and -1), which shows the homogeneity of the sample in the previous variables.

Research Means and Devices

- Arab and foreign references and sources
- Biosyan Systms.
- Kinovea Program.
- Tests and measurements.
- Results registration form.
- Physiotherapy devices (Tens), sound Ultra.
- A device for measuring weight and height prepared for this purpose - an electronic stopwatch.
- HP laptop computer.
- Ancillary staff.

Field Research Procedures: Research Tests

- Test to measure the player's speed and angles during javelin throw.
- The goal of the test: To measure the throwing speed, the angle of throw, acceleration of the player, trunk tilt angle, the angle of elbow, angle of the javelin ,the angle of the knees of the front foot ,the initial speed, and the final five steps before throwing the javelin.

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- Test description: The test sensors are placed on the required areas of the body which are (head - back - lower back - ulna muscle - forearm muscle - thigh muscle - obesity muscle - a platform for measuring the strength of the feet).
- Recording method: registration is by means of waves sent through receivers and sent to the main receiver connected to the computer in order to record the results through mathematical equations where it can record 120 information per second. Where all these results are collected in the computer in order to see the parameters.

Physical Tests

Vertical jump test Short Run 30m .

Throw iron ball front, back 6kg .

Kinetic speed test

Training Program

The researchers conducted the main experiment on 20/1/2019 for a period of (10) weeks, at a rate of (3) eligible units per week. The duration of the training unit was (60-70) minutes. The experimental and control groups were subject to the training conditions in terms of time and environmental conditions themselves, with the exception of adding exercises. Gradient exercises from easy to difficult, emphasizing the correct technique for the effectiveness of the javelin, which increases the range of movement in all directions, movement, and preparing a set of instruction and correction exercises in order to obtain an ideal technique for the required skill. Likewise, doing positive and negative flexibility exercises to develop muscle strength, knee joint elbow elasticity by means of rubber ropes, devices with different weights, medical balls, and iron balls, and special devices for spear-throwing angles, the most important of which are the throwing angle that is the basis of projectiles, and elongated exercises that extend using body weight, Exercises using different resistances (marginal weights) from (20% to 40%) and medical balls using the strength of momentary exercises in the opposite direction, using weightlifting and tools, in addition to body weight exercises such as rubber jumping ropes and a different resistance, Such as (iron weights, different iron tablets), and the intensity of exercise (70% - 90%). Where the exercises were prepared in the special preparation period before the competitions, with a total of (1.800) training minutes. as shown in Table (2).

Table 2: It Explains How to Distribute the Training Percentage of the Variables According to the Percentage of their Contribution to Achievement.

	biomechanical variables	Contribution rate	The total time of the variable	Training unit time
1	Acceleration	44.39%	799.02m	26.6m
2	Angle of the throwing	23.36%	420.48m	14.0m
3	Speed of the 5 steps	12.62%	227.61m	7.57m
4	Speed of throw	9.81%	176.58m	6m
5	The angle of knee front leg	9.81%	176.58m	6m
6	Total	99.99%	1799m	60m

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Statistical Means

To process the data used, the researcher used the statistical program SPSS and T test.

III. RESULTS

Presentation, Analysis and Discussion of Results

Table 3: Results of the Pre and Post Experimental Group Test in the Studied Variables from the Javelin Technique.

biomechanical variables	T	Pre		Post		(P)
		σ	X2	σ	X2	
Acceleration	5.49	0.20	-0.03	0.05	0.20	< 0.00
Speed of the 5 steps	3.03	0.48	4.75	0.28	5.05	< 0.01
Angle of the throwing	5.75	2.46	40.22	1.31	36.78	< 0.00
Speed of throw	4.29	1.82	24.73	0.89	26.02	< 0.00
The angle of knee front leg	9.51	6.49	144.33	2.70	167.61	< 0.00
Total	-4.00	3.50	66.72	2.38	81.27	< 0.00

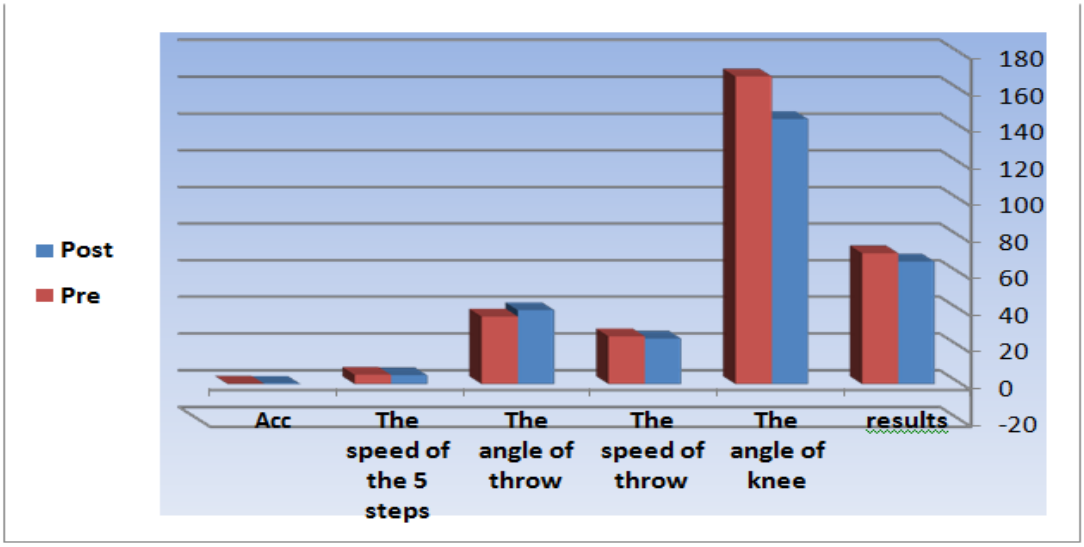

Figure l: Illustrates Results of the Pre and Post Experimental Group Test in the Studied Variables from the Javelin Technique.

Table 4: Results of the Pre- and Post-Control Group Test in the Studied Variables.

biomechanical variables	T	Pre		Post		(P)
		σ	X2	σ	X2	
Acceleration	1.51	0.10	-0.01	0.08	0.12	> 1.49
Speed of the 5 steps	-1.03	0.28	4.82	0.28	4.85	> 0.31

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Angle of the throwing	2.01	2.20	41.00	1.23	40.11	> 0.06
Speed of throw	0.15	1.55	24.17	1.22	24.21	> 0.88
The angle of knee front leg	-2.71	5.89	145.50	5.42	148.0	< 0.02
Total	-3.76	2.41	67.07	1.30	67.42	< 0.00

IV. Discuss The Results

Table 3. illustrates the value (T) of the bound samples to show the difference between the results of the experimental group at the beginning and end of the test. The significance level was less than (0.05), which confirms the existence of a significant difference and prefers a post-test of variables (acceleration, speed of throwing steps, release angle, release speed, bend angle of the knee of the front leg, achievement). All this confirms the role of exercises prepared by the researcher in accordance with the contribution of variables to the result, where these exercises positively affect not only the achievements of the members of the experimental group, but also the changes in important variables in the throwing technique. Exercises in the experimental group were developed taking into account the obtained scientific data and in accordance with the requirements for competence. Specialization taking into account the priority in teaching and training the contribution of each exercise to the development of competencies, so that the training unit becomes an effective and important achievement confirming the results of the experiment. Table (4) shows the value (T) of the correlated samples to show the difference between before and after the test in the studied variables. Significant differences between the pre-test and post-test of the control group. The researcher explains these random differences by the fact that the use of traditional exercises, such as throwing nuclear stones of different weights or weightlifting exercises, which cannot exactly meet the requirements of the technique during training, and thus, do not use the muscle strength of muscle groups working in the corresponding direction , which serves as an acceleration, rhythmic speed of rhythmic steps, departure speed and release angle. In the experimental group, the exercises were strictly focused on specific tasks. Regarding the variable (the angle of flexion of the knee of the front leg), the difference was significant in favor of the post- test, since the exercises performed by members of the control group with their trainers who worked on the development of muscle strength of the two legs, which helped to increase the angle of flexion of the knee of the front leg, which also contributed to develop this variable. The training contributed to the development of achievements among the members of the control group.

V. Conclusions And Recommendations

Conclusions

Javelin throwing is a complex coordination motor action, the result of which depends on both the level of special physical fitness and the technical skill of the athlete. Biomechanical analysis of the technique of research participants and computer processing of the results of the analysis of the technique showed that the following technology variables influence the growth of sports achievements: speed of throwing steps, speed of the spear, angle of release, acceleration, bending angle of the knee of the front leg at the time of release of the spear. The

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initial indicators of the athletes of the experimental group were compared with the criteria of the technique of outstanding throwers. This made it possible to prepare an experimental program for training athletes, select exercises, determine the order of change in load, both in volume and intensity, and in alternating load and recovery. All this made it possible to increase athletic performance and improve the biomechanical variables of the javelin throwing technique by the end of the experiment.

Recommendations

1. Consideration of biomechanical variables in the construction of the training process in the javelin throw of the Iraqi national team has made a great contribution to the growth of sports achievements.
2. Based on the data of biomechanical analysis and testing of special physical fitness, the levels of technical and physical fitness of the participants in the experiment were determined.
3. The results of the initial level of technical and special physical fitness made it possible to develop models of technical and physical fitness with specific individual characteristics for participants in the experimental group.
4. In the process of mathematical processing of the results of the pedagogical experiment, statistically significant differences between the experimental and control groups were revealed.

REFERENCES

[1] Mohammed Jassim Al-Yassiri, Marwan Abdul Majid: Recent Trends in Sports Training, Amman, Al-*Varraq Foundation*, 2004, p. 17.
[2] Maksimenko, A.M., Theory and methodology of physical education: a textbook for universities of physical education / A.M. Maksimenko 2nd ed., Rev., And dol. - M .: *physical education*, 2009.-490 p.
[3] Mohammed al-Khalidi: Biomechanics in Physical Education and Sport, House of Books and Documents, *Baghdad, I*, 1, 2012, 74.
[4] textbook / I.S. Barchukov; gender commonly ed. G.V. Barchukova.-2nd ed., Erased. M.: KNORUS, 2012.-360 p.
[5] Samir Musallat Al-Hashimi: Mathematical Biomechanics, *Al-Nibras for Printing and Design*, 2010, p. 85.
[6] Saleh Shafi al-Athletic, athletics training, p.60. 2011.
[7] Ziad Kurdi: *Critique of the literature on the Biomechanics of Javelin throwing Al- Yarmouk* ,. 1990.78.
[8] Susan J. Hall, Basic Biomechanics. *London: Moby-year book*, Inc, 1995.P.13.
[9] Popov Grigory Ivanovich: Biomechanics. *Moscow, Academa*. 2005. S. 11-15.
[10] Pavel Karpovich Petrov: Methodological manual. *Izhevsk.* 2014. P. 21-22.
[11] Yu.P. Malkov, A.E. Alabuzhev: *Athletics. Izhevsk.* 2010. S. 26-27.
[12] Maksimenko, A.M .: Theory and methodology of physical education: a textbook for universities of physical education / A.M. Maksimenko. 2nd ed., Rev. And dol. - *M.: Physical Culture*, 2009.-496 p.
[13] Riku Vallealea: Finnish Studies Spear throwing of the 21st century. *Helsinki.* 2011.
[14] Morris, C Barlett R .; Navarro E. Lock function in elite javelin throw: reevaluation. *Journal of Human Movement Studies*, 41, 175-190, 2001.
[15] Abdel-Aziz Yu.I. and Karara, G.M. Direct linear conversion from comparator
[16] Best R.J., Bartlett R.M. Morris C.J .: Three-dimensional analysis of the javelin thrower technique at the 1991 World Student Games *J.Sports.Scieces.* 11 (4), 315-328, 1993.
[17] Abernathy, Bruce. Biophysical Foundations of the Human Movement, *HumanKinetics*, 2013.
[18] Campos J., Brizuela J., Ramon W., and James G.: Analysis of kinematic parameters between javelin throwers in the Spanish and world classes. *Archived ISBS Conference*, 2002.
[19] Gordon E. Robertson and others; *Research methods in biomechanics.* (USA, Human Kinetics Publishers, 2004).
[20] Borgstor, A. Bartonictz, K: The biomechanics of throw events - an introduction to a simplified way of surprise using conventional video equipment: documenting the express information given in the throw events during the 5th IAAF World Athletics Championships, Gothenburg. 1995.
[21] Yu.F. Kuramshina. -2nd of., Rev.-M .: *Soviet Sport*, 2004.-464 p.

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