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The Use of Equations to Organize Training for Both Shot Put and Discus Throws

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Abstract

The effectiveness of the Shot Put and Discus Throws depends to a large extent on resistance training with weights, which reach a single training unit, a group of tons, and those loads are distributed over a group of exercises such as: Squat, Bench Press, front jerk, the snatch and clean.

The researchers determined which exercises are more specific to the effectiveness of discus and Shot Put throws, and after performing statistical operations according to predictive equations, the snatch exercise showed an effect on the effectiveness of the discus throw, and the front jerk exercise for the effectiveness of the Shot Put throws.

After that, a proposed equation was applied that includes the results of the snatch exercise test to represent the strength and the mass of the disc to represent the resistance to predict the distance to achieve the effectiveness of throwing the disc according to the following:

Disc throw distance = snatch test (kg) x 1 m / mass of disc (2 kg).

A proposed equation was applied that includes the results of the front -jerk exercise test to represent strength, and the iron ball mass to represent the resistance to predict the distance to achieve the effectiveness of Shot Put according to the following:

The Shot Put distance = front -Jerk test (kg) x 1 m / mass of the iron ball (Shot Put (7.260 kg).

Therefore the throwing and pushing distance was derived from the two equations and for each operation, and a correlation was made between it and the actual completion, distance, which showed a very high correlation, suggesting the high accuracy of the proposed predictive equation when displaying the results.

Keywords: *Organize Training, Shot Put and Discus Throws*

I. Introduction and the importance of research:

The requirements for discus and Shot Put throws training depends to a large extent on weight exercises to develop the types of strength necessary to improve the throw and push distance, as well as technical performance and exercises for body weight, as we find that trainers put a high percentage of strength training using weights in their curricula, which requires Obtaining an indication of these exercises and translating them

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into throwing and pushing distance, so the use of predictive equations suggested by researchers will greatly help trainers in identifying the level of strength of shooters and pushers in relation to achievement, and this will be reflected in planning their training programs and determining the deficiency if fond in exercises Weightlifting or technical performance.

1 Research Objectives:

1. Establishing a predictive mathematical equation that includes the highest level of the snach lift exercise test divided by the disc mass.

2. Developing a predictive mathematical equation that includes the highest level of the front jerk exercise test divided by the ball mass.

2 Research hypotheses:

1. There is a match between the results of the predictive mathematical equation and the achievement of discus throwing effectiveness.

2. Existence of a match between the results of the predictive mathematical equation and the achievement of the effectiveness ofShot Put.

3 Research problem:

Due to the lack of equations that determine the relationship between weight exercises and the level of achievement for the activities of throwing the discus and Shot Put, so that they give the coaches clear information about the level of weight training for the thrower and the thrust with the distance achieved, in an easy-to-use manner and does not require long statistical treatments, and the absence of equations based on strength (weight Weight training), resistance (block thrown and pushed tool), (discus or iron ball). Therefore, the two researchers deliberately dealt with solving such problems by means of these equations.

4 Research fields:

1. The human field: the (6) Iraqi champions from the category of applicants for the activities of throwing the discus and pushing the ball.

2. The temporal domain: 1-10-2019 - 1-5-2020

3. Spatial domain: Sulaymaniyah Governorate Athletics Stadium.

II. Research methodology and field procedures:

2-1 The Approach: The descriptive approach was followed for its relevance to the nature of the problem.

2-2 The research sample: the (6) champions of Iraq for the activities of throwing the discus and pushing the ball of the ball, and the participants in the Iraq Clubs Championship that took place in Sulaymaniyah for the period (28 - 10 - 2019), as they were deliberately chosen.

2-3 research procedures:

2-3-1 Mathematical Equations:

The arithmetic equations were built in accordance with the predictive equations by choosing the most specific weight exercises for each activity so that if we divide its result by the weight of the throw or pushed tool for each activity the throwing distance is determined by the weight of the tool as a measure and compared to the strength that the shooting and pointers are dealing with.

a. Discus throw efficiency: more than one exercise was investigated (Bench-press, Snatch, Squat,Clean, and the front-jerk), and the best results of those tests were used to test the shooters according to the results of their regression equation, and divided by the weight (Disk) (2 kg).

The predictive discus-throwing equation = test of snatch leverage (kg) x 1 meter / mass of the legal throwing tool for men (2 kg), noting that (1 meter) is the conversion factor of units from kilograms to distance in meters, where disc throw distance = snatch (kg) X 1 m / 2 kg.

B. The effectiveness of pushing the weight: More than one exercise was studied (such as the Bench-press, the snatch, the Squat, Clean, and the front- jerk), and after adopting the best test result of those exercises for the iron ball pushers according to the results of the regression equation and dividing it by the mass of the tool (the iron ball) of (7.260) Kg), so the result of the front- jerk joints was the highest accuracy and with a lower error rate.

The predictive Shot Put equation = the front -jerk test (kg) x 1 meter / mass of the legal propulsion tool for men (7.260 kg), noting that (1 meter) is the conversion factor of units from the kilogram to the distance in meters, where the distance of the Shot Put is the front-Jerk KG) x 1 m / 7.260 KG

2-3-2 Tests:

A set of tests was conducted, including:

1. Discus throw test: The disc is thrown from complete performance, according to the legal conditions. The distance is measured in meters and its parts from the closest impact caused by the disc's fall (1).

2. The Shot Put test: The Shot Put throw from complete performance in accordance with the legal conditions. The distance is measured in meters and its parts from the closest impact caused by the fall of the iron ball (2).

3. Snatch lift test: From the performance of the entire movement by holding the iron bar with two hands with a wide opening and pulling the weight to the top of the head. The weight is measured in kilograms and its parts.

4. The front jerk test: from performing the movement completely by fixing the weight on the shoulders in front of the chest and holding the iron bar with the hands, as the opening of the hands is shoulder width apart, and then pushing the weight to the top by extending the arms completely with the exchange of the legs, and the weight is measured in kilograms and its parts.

2-4 Statistical methods: The two researchers used the statistical bag (SPSS), version (10), in processing data extraction for the research.

III. Presentation, analysis and discussion of results:

3.1 Presentation, analysis and discussion of the results of discus throwing:

Through Table (1), which shows the results of the actual achievement and the achievement according to the prediction equation, the snatch lift test, and the B, A value of discus throwing effectiveness.

Table (1)

Shows results of actual achievement and achievement, according to the prediction equation, snatch lift test, and A, B value of the discus throw effectiveness

Acutul Achievement (M)	snatch Lift test (kg)	achievement according to the prediction equation (M)	T	Sig.	B	A
60.60	125.00	60	4.22	0.001	0.362	14.838
60.00	120.00	58.27				
51.40	110.00	54.65				
50.14	100.00	51.04				
49.82	95.00	49.23				
48.66	90.00	47.72				

The achievement values were extracted according to the prediction equation (3)

$B + A \times D = C$

By knowing the results of the prediction equation, it appears that the snatch lift test is more influenced by the discus throw distance in relation to other weight tests (Bench-press, snatch, squat, clean, and front- jerk), in order to exclude them from the prediction equation.

Table (2)

It shows the results of actual achievement and achievement, according to the proposed equation, and the value of the correlation coefficient, and the significance of the effectiveness of discus throwing.

actual achievement	achievement according to the prediction equation (M)	correlation coefficient value	Sig.
60.60	62.5		

60.00	60	0.941	0.005
51.40	55		
50.14	50		
49.82	47.5		
48.66	45		

The achievement value was extracted according to the proposed equation as follows

Throwing distance = Snatch test (kg) x 1 m / Mass of disc (2 kg).

The results of the multiple regression variance analysis showed that there was a statistically significant effect at a high level of significance for the independent variable (snatch lift test) on the dependent variable (achievement).

As Table (1) presents the results of the multiple regression analysis, which is represented by the value of the parameter (B) and the value of the (Beta) parameter, then the value of (T), and its statistical significance, as it is evident from the table that the results of the RIFT test have a positive, statistically significant effect on the actual results because its significant value is less than the significance level of (0.01).

Also shown in Table (2) a high correlation relationship (0.941) between the results of the proposed equation and the actual results of achievement (4), which indicates that the components of the construction of the arithmetic equations depended on variables related to effectiveness. For the archer, and that the comparison of the marksman's level in this exercise with the resistance (disc mass 2 kg) for men was accurate, meaning that the equation is based on two variables, namely the force represented by the result of the snatch lift test and the resistance represented by the throwing tool (disc)(1), then the snatch exercise appeared as the most effective weight training for the effectiveness of throwing the discus, we find that the effectiveness of the discus throw depends in its performance on the explosive pull movement with respect to the outstretched arms (5), which puts a high effort on the shoulders and arms muscles, as well as the great role of the leg muscles in pushing and stabilizing, and this is identical. The shape a lot with the abduction exercise, as well as the nature of the explosive movement in throwing and the snatch exercise, which made this exercise more congruent in the muscular work and the movement path for the effectiveness of discus throwing compared to the rest of the weight lifting exercises.

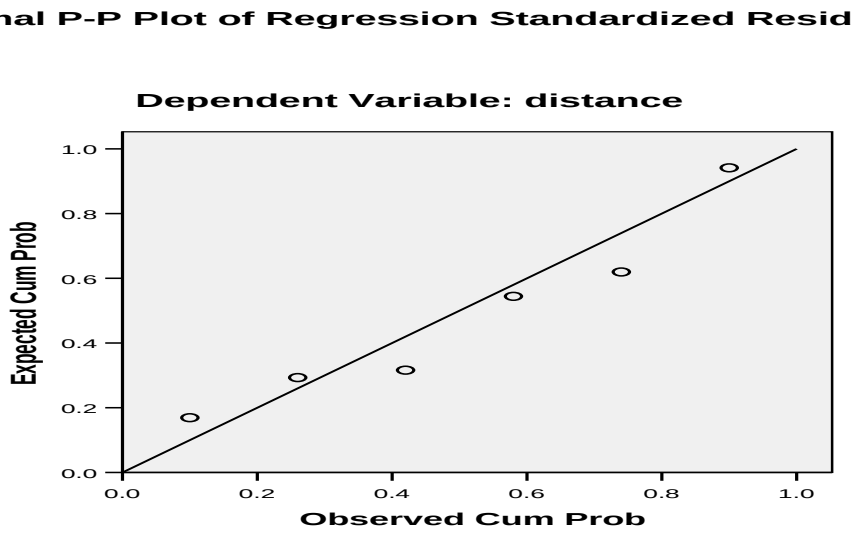

Fig (1)

Shows the distribution of score points around the slope line for snatch lift and achievement discus throw

3-2 Presentation, analysis and discussion of the results on the effectiveness of Shot Put throw:

Table (3)

Includes results of actual achievement, achievement, according to prediction equation, snatch lift test, and B, A value of Shot Put throw effectiveness.

Acutul Achievement (M)	snatch Lift test (kg)	achievement according to the prediction equation (M)	T	Sig.	B	A
18.35	130.00	17.74	3.66	0.006	0.104	3.952
16.20	120.00	16.43				
15.90	115.00	15.91				
15.50	120.00	16.43				
15.20	110.00	15.39				
14.90	100.00	14.35				

The achievement value was extracted according to the proposed equation as follows

D = C x B + A

By knowing the results of the prediction equation, it appears that the front grip test is more influenced by the distance of the ball thrust in relation to other weight tests (Bech-press, snatch, Squt, clean, front -jerk), in order to exclude them from the prediction equation.

Table (4)

It shows the results of the actual achievement and the achievement according to the proposed equation, and the value of the correlation coefficient, and the significance of the effectiveness of Shot Put throw

actual achievement	achievement according to the prediction equation (M)	correlation coefficient value	Sig.
18.35	17.90	0.857	0.029
16.20	16.53		
15.90	15.84		
15.50	16.53		
15.20	15.15		
14.90	13.77		

The achievement value was extracted according to the proposed equation as follows

As Table (3) shows the results of multiple regression analysis, which are represented by the value of the B parameter, the value of (Beta), then the value of (T), and its statistical significance.

It is clear from the table that the results of the front- jerk test have a statistically significant positive effect on the actual results, because the significant value is less than the significance level of (0.01).

In Table (4), a high correlation relationship (0.857) appeared between the results of the proposed equation and the actual results of achievement, which indicates that the components of arithmetic equations construction depended on variables related to effectiveness.

In the effectiveness of Shot Put throw , the result of the front -jerk exercise was adopted to represent the strength in the equation, and the mass of the iron ball represents (7.260 kg) for men, which represents the resistance, because it is the real indicator of resistance in the race, as the front –jerk exercise was adopted to match the shape of the musel performance of the push and the muscles Participation and the nature of the muscular work (6) The effectiveness of Shot Put (pushing the iron ball) also depends on the extension movement of the propeller arm, and does not depend on the movement of the bending, that is, it appears in the form of general movement pushing rather than pulling, as well as the role of the legs and the fixation and the explosive push movement , and this is what is included in the front- jerk exercise of Pushing the arms forward higher with the strong push of the legs and in an interchangeable way (7).

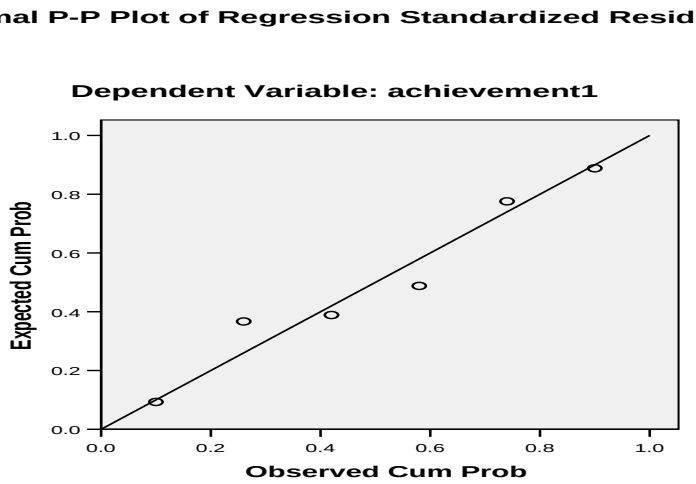

Figure (2)

Shows the distribution of score points around the incline of the front- jerk test and the Shot Put achievement

IV. Conclusions:

In light of the researchers ’findings, a set of conclusions was drawn up:

1. The snatch exercise is the most special barbell exercise with discus throwing effectiveness, and the front- jerk exercise is the most special barbell exercise with the effectiveness of the Shot Put throw.

2. Predictive equations found a correlation between weight training and achievement for both discus and Shot Put effectiveness.

3. Adopting the mass of the thrown and driven tool as an indicator in the proposed mathematical equations, as it gives accurate prediction results.

V. Recommendations:

1. Use of predictive equations in planning training.

2. Applying the predictive equations to other throwing activities such as (Javelin and Hammer throw)

3. Applying the results of predictive equations to higher-level samples such as world champions with discus throwing and Shot-Put activities.

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