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Determining the effectiveness of the correct rotation technique for hammer throwers in the training group

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Abstract

Purpose: The goal of the athletics training group is to improve the technique of proper rotation and increase the efficiency of hammer throwers in the training process.

Methods: In the course of the research, such methods as analysis of scientific and methodological literature, theoretical and comparative analysis, questionnaires, pedagogical observation, conversation, comparison, pedagogical experience, mathematical statistics were widely used.

Results: It was noticed that the average throw range was 44.6 meters, and the take—off angle was 37.8. A comparative analysis of the results obtained with the data provided by Bondarchuk A and Ozolin N revealed some difference between them, and the angle of take off of the hammer turned out to be low. Considering this circumstance, we came to the conclusion that with a hammer throwing angle of 45°, the projectile will have an optimal speed and increase the range of flight.

Conlcusion: The results obtained at the end of the experiment showed that the transition from point A to point B (with a stick) increased 560 times in four months. And we see that the pursuit of the projectile in a semi-sitting position reaches 1100 times. The rotation of the projectile over the head. (3-4-5-6-7.260-10 kg) Rotate the projectile 380 times with one hand. (3-4-5-6-7.260-10 kg) 220 times, rotation stuffed ball with tape, with one hand, in a semi-sitting position, 340 times, rotating with sandbags of different weights. Rotating sandbags and shortened and elongated filled balls has increased to 940 time and to 860 times. We see that the level of significance has shifted up somewhat compared to the indicators of the training group.

Keywords: centrifugal force, arc point, circle line, rotation speed, degree, projectile, ball with fillers

Introduction

Currently, our athletes are achieving high results on the Asian and world arenas, at the same time, irreconcilable disputes are growing in world sports, and, accordingly, the training of athletes is based on a certain system, and its appearance is compatible with science.

Despite the fact that the athletes of our country have achieved certain achievements on the world arenas in the hammer throwing, in order to maintain these indicators and achieve new results, it is necessary to develop training structure programs. In the modern process of globalization, it is shown that it is necessary to achieve high sports results on the basis of improving the necessary abilities in the training system of hammer throwing athletes. To do this, it is necessary to further develop the ability of hammer throwers to rotate correctly.

Nowadays, good results have been achieved among our throwers in javelin and hammer throwers, especially Andrei Abduvaliev and Sukhrob Khodzhaev should be noted in the men's hammer throwing, as well as the lack of reserve athletes in this category and the lack of young people in the hammer throwing is a disadvantage. For this reason, teaching the training group the correct rotation technique and improving throwing exercises is considered one of the relevant topics.

Methods

The literature on the technique of rotation of hammer throwers in the training group was studied and a scientific and theoretical analysis was carried out. The influence of the correct rotation technique on the result during the throw is revealed. The control tests obtained in order to determine the correct rotation technique are as follows:

- The passage of the hammer through one point during rotation;
-Rotation at a distance of 2 meters;
-Shuttle run.

Results and discussion

We study and analyze the sports results of the training group of hammer throwers, the programs of the training structure, and the results show that the most important thing in the initial training of hammer throwing is proper training in the technique of rotation. When analyzing the rotation technique in hammer throwing, a number of shortcomings in performing rotational movement were noted. These shortcomings do not make it possible to fully show the results of the athlete. When analyzing the technical training of throwing

Table 1. Control analyses were carried out to determine the correct rotation technique

№	Control test	1st attempt in 6 rotations	2nd attempt in 6 rotations	3rd attempt in 6 rotations	4th attempt in 6 rotations
1	The passage of the hammer through one point during rotation	2	1	3	2
2	Rotation at a distance of 2 meters	1st attempt 11 feet (5.5 rotations)	2nd attempt 10 feet (5 rotations)	3rd attempt 10 feet (5 rotations)	4th attempt 9 feet (4.5 rotations)
3	Shuttle run	10x2	10x3	10x4	10x4
		4.65	**7.20**	**9.58**	**9.60**

athletes in rotation, the following was observed.

In the hammer throwing, the initial rotational movements are performed by the athlete. After reaching a certain speed, the thrower himself begins a circular motion of the projectile. During the execution of the projectile to the arc point. The speed of rotation of the projectile depends on the distance to the center of gravity of the projectile and the angle of take off the projectile. It is noticed that the larger the radius of rotation when throwing, the higher the acceleration of the projectile in a straight

Table 2. Special exercises performed to increase the effectiveness of the correct rotation technique of the hammer throwers in the training group

№	Control tests	February	March	April	May	Total
1	Transition from point A to point B (with a stick)	500 times	520 times	540 times	560 times	2120
2	Pursuit of the projectile in a semi-sitting position	1000 times	1030 times	1060 times	1100 times	4190
3	The rotation of the projectile over the head (3-4-5-6-7.260-10 kg)	320 times	340 times	360 times	380 times	1400
4	The rotation of the projectile with one hand (3-4-5-6-7.260-10 kg)	160 times	180 times	200 times	220 times	760
5	The rotation of stuffed ball with tape, with one hand, in a semi-sitting position	280 times	300 times	320 times	340 times	1240
6	Rotating with sandbags of different weights	880 times	900 times	920 times	940 times	3640
7	Rotating sandbags and shortened and elongated filled balls	800 times	820 times	840 times	860 times	3320
8	**Total**	**3940**	**4090**	**4240**	**4400**	**16670**

rotational movement, the athlete tries to give hammer more speed. In this situation, the thrower increases his speed by overtaking the projectile and rotating in a straight line. At the same time, the rotation technique becomes more complicated as the speed increases in a straight line due to the centrifugal force between the athlete and the projectile. In this case, the centrifugal force will be at least above 270 kg. In this case, as the centrifugal force escapes, the counteracting centripetal force also increases. When performing a circular motion with a hammer, the flight of the projectile affects the center of gravity of the arm along a circular line from the place where the centripetal force ends on the line.

It depends on the correct execution of the movements that are an integral part of the initial roll with the rotation of the body. We determined the level of development of the rotation technique of the hammer throwers participating in the training group using the above-mentioned control test. In this regard, we saw that the training group did not work out the technique of throws during rotation well enough. We developed the following program in order to improve the effectiveness of the correct rotation technique during throws, and also developed and put into practice a training program that develops the of teaching the ham

Table 3. Special exercises performed to increase the effectiveness of the correct rotation technique of the hammer throwers in the training group (the situation in the 1st and 2nd months)

№	Control tests	1st month	2nd month	Difference	%
1	Transition from point A to point B (with a stick)	500	520	20	4,0
2	Pursuit of the projectile in a semi-sitting position	1000	1030	30	3,0
3	The rotation of the projectile over the head (3-4-5-6-7.260-10 kg)	320	340	20	6,3
4	The rotation of the projectile with one hand (3-4-5-6-7.260-10 kg)	160	180	20	12,5
5	The rotation of stuffed ball with tape, with one hand, in a semi-sitting position	280	300	20	7,1
6	Rotating with sandbags of different weights	880	900	20	2,3
7	Rotating sandbags and shortened and elongated filled balls	800	820	20	2,5

Table 4. Special exercises performed to increase the effectiveness of the correct rotation technique of the hammer throwers in the training group (the situation in the 1st and 3rd months)

№	Control tests	1st month	3rd month	Difference	%
1	Transition from point A to point B (with a stick)	500	540	40	8,0
2	Pursuit of the projectile in a semi-sitting position	1000	1060	60	6,0
3	The rotation of the projectile over the head (3-4-5-6-7.260-10 kg)	320	360	40	12,5
4	The rotation of the projectile with one hand (3-4-5-6-7.260-10 kg)	160	200	40	25,0
5	The rotation of stuffed ball with tape, with one hand, in a semi-sitting position	280	320	40	14,3
6	Rotating with sandbags of different weights	880	920	40	4,5
7	Rotating sandbags and shortened and elongated filled balls	800	840	40	5,0

Table 5. Special exercises performed to increase the effectiveness of the correct rotation technique of the hammer throwers in the training group (the situation in the 1st and 4th months)

№	Control tests	1st month	4th month	Difference	%
1	Transition from point A to point B (with a stick)	500	560	40	8.0
2	Pursuit of the projectile in a semi-sitting position	1000	1100	70	7.0
3	The rotation of the projectile over the head (3-4-5-6-7.260-10 kg)	320	380	40	12.5
4	The rotation of the projectile with one hand (3-4-5-6-7.260-10 kg)	160	220	40	25.0
5	The rotation of stuffed ball with tape, with one hand, in a semi-sitting position	280	340	40	14.3
6	Rotating with sandbags of different weights	880	940	40	4.5
7	Rotating sandbags and shortened and elongated filled balls	800	860	40	5.0

mer throwers the correct rotation technique during the four months of our training group, and also developed their rotation technique by applying it in practice (see table 2). To maintain balance when throwing a hammer, the average speed of throwing a hammer should be equal to 25.2 m/s. In the following tables we can see the change in the throwers of the training groups by month.

Conclusion

The results of the literature review indicate that there are very few materials on the analysis of the technique of rotation of hammer throwers. Our new projectile throwers had an average projectile take off angle of 38°. This leads to the fact that the projectile does not fully take off optimally. When throwing a hammer, the angle of take off of the hammer, equal to 45°, ensures its acceleration above 30 m/s and provides a sports result of longer than 50-60 m.

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