

The impact of weighted basketball balls in improving certain physical performances via wheelchair basketball players

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Abstract. The research aims to determine the effect of a weighted basketball balls training program on some physical performance via wheelchair basketball players. The sample was selected in an intended manner including 20 players'. Divided into two equal groups (experimental 10 players, control 10 players) for the sports season 2016/2017. As protocol experimental, our training program for the experimental group was applied under researchers' supervision, using Weighted basketball balls in the opposite of control group which used the same program with real weight basketball. All the tests practised (pre or post test) were conducted with the same team and in the same condition based on endurance test (1000 m), speed test (30 m), push the medical ball and dribbling to test the agility. After statistically processing, it was clear that weighted basketball balls as ingrate tool led to the increase of physical performance intended to study. In the opposite of traditional method.

Keywords. Physical performance, physically handicapped, training program, wheelchair basketball players.

Introduction

Disabled sport was a means of rehabilitation for disabled persons. Nowadays disabled sport is acquiring a different status – it is accepted as every citizen's right. New possibilities to take part in sports activities open up for disabled athletes. A lot of scientists researching the issue share such an opinion, emphasising the importance of sport in the life of disabled persons (Brasile et al., 1996; Brunelli et al., 2001; Dewell, 2001; Goosey-Tolfrey et al., 2002; Haisman, 2006).

Wheelchair basketball is one of the most popular sports among the Paralympic disciplines and is practised by people with different disabilities, according to the classification protocol of the International Wheelchair Basketball Federation (IWBF). WB is an intermittent sport which combines repeated high-intensity sprints and rapid accelerations and decelerations with moderate and low-intensity actions, with the purpose, among other aims, of achieving or maintaining a good position on the court (Molik et al., 2010).

Wheelchair basketball is a recreational and competitive sport played by participants with and without a disability (Groot et al., 2003). The sport of Wheelchair Basketball is similar to that of its able-bodied counterpart in terms of rules and gameplay. It is a team game that allows athletes with varying degrees and levels of disabilities to participate together based on an individual player classification system (Brasille & Hedrick, 1996).

Wheelchair basketball is a physically demanding team sport that requires a high degree of skill, technical expertise, and teamwork. Acceleration, speed, and agility are of particular importance since the game is often played at a fast pace and excellent chair and ball skills are fundamental to the game. A high level of conditioning is required to maintain work intensity and to prevent injury (Goosey-Tolfrey, 2010). In order to reach competitive levels, relying on the development of the basic skills related to the game in the first step (Malone et al., 2000).

The training program for persons with disabilities should comprise the five major motor abilities which are endurance, flexibility, coordination, strength, and speed (Kelley & Freiden, 1980; DePauw & Gawron, 1995; Knechtle & Köpfl, 2001).

Pre-season exercises focus on strength development of specific muscle groups, actions, and energy systems (Green, 1999). Strength, endurance, flexibility and speed. Performance can be enhanced by technical-tactical play drills. But wheelchair basketball trainers should also include special exercises based these drills in their training program to enhance the condition of their players: weight training, speed training; endurance training; and exercises for special muscle groups. Developing offensive and defensive skills aids to conditioning (Kelley & Freiden, 1980; Owen, 1982; Green, 1999).

Sprints repeated often enough to improve your wheelchair handling and supervised weight training to help improve the strength of muscle groups used in wheelchair basketball should be dispersed in the training

both before and during the competitive season (Kelley & Freiden, 1980; Owen, 1982; Green, 1999).

Disabled basketball players rely entirely on the strength of the arms in their movements and movements, whether through crutches or wheelchairs in addition to the performance of all basic skills, and therefore the development of explosive capacity as a result of special exercise has contributed significantly to the development of the accuracy of long handling performance from above the shoulder in the members of the research sample, and this is confirmed by many studies on the importance of explosive power of the arms of the disabled and the impact of the positive effect of the performance of motor skills in various sports activities (Chahinaz, 1994).

Skucas (2012) adds to the development physical skills is a very important part of preparing for wheelchair basketball competitions. The development level of disabled wheelchair basketball player has a great influence on the final results and future athlete's perspective of the disabled person.

Like that Ball handling may include shooting, passing, dribbling, rebounding and shooting above the head level with simultaneous manipulation of the wheelchair during the game. Therefore, upper-extremity muscle strength is important for wheelchair athletes (Tupling et al., 1986; Wang et al., 2005).

Study of Iturricastillo et al. (2015) suggests the wheelchair basketball players showed the change during the season in some variables of body composition and physical fitness, in acceleration capacity over 5 and 20 m with the ball, strength, the handgrip test, and the total distance covered in the endurance test. However, no differences were observed in acceleration capacity without the ball, change of direction ability, or explosive strength. Coaches of WB teams should consider the need to implement additional specific training sessions to improve these abilities in WB players (Iturricastillo et al., 2015).

All this shows that disabled persons aim at a very high performance. However, wheelchair basketball players' and team's results depend mostly on the physical skills and abilities level. This issue has not been researched much. Possibilities for applying for various wheelchair basketball programs and their efficiency in developing wheelchair basketball players' physical skills in order to achieve high results have not been researched much. (Valandewijck et al., 1999; Valandewijck et al., 2003).

With the increasing number of players involved in sports teams raises concerns about training and fitness issues, as well as is the insufficient number of qualified trainers of wheelchair basketball.

Increase in physical and athletic performance some players in sports competitions, it is the participation of some teams in the competition without regular training or absence from training all this led us to think about employing of recruitment exercises using the weighted

basketball balls in training sessions to improve some of the physical elements in wheelchair basketball players.

Methods

Researchers used the experimental method by choosing two groups. One of them experimental and the other control.

Participants

Twenty male wheelchair basketball athletes from two different clubs of the same league (national league) participated in the study. Their mean age was 30 years and their mean competitive experience was 7.5 years.

The two teams were randomly assigned to the group experimental sample: 10 players from a team of abtalle to Aïn témouchent (Algeria). And control sample: 10 players from the ossoud team to Oran (Algeria), of the sports season 2016/2017.

Specifications of physical tests

Test 1: Endurance test (1000 m), Test 2: Speed test (30 m), Test 3: Test push the medical ball by hands (3 kg), Test 3: Test the dribbling between the obstacles

Training program

The proposed training sessions were held from October, 18th 2016 to December, 13th 2016 during evening training sessions. After the training program under the practice of the ball, the researchers applied this training program, which aims to develop some elements of physical performance of wheelchair basketball players, the program included three training units in a week of eight weeks. Ball exercises consisted in: 1) Running with the ball, 2) Ball Conversation Exercises, 3) Exercises for passing and receiving ball, 4) Ball throwing exercises on the wall, 5) Exercises to shot the ball in the basket.

Data Analysis

All data were presented as mean and standard deviation. Unpaired t-test and paired t- test were conducted to compare differences between groups. Statistical significance level was set at 0.05.

Results

View and analyse the results of tribal and remote tests of the control and experimental sample

For the control sample the arithmetic average in the pre-test of endurance (1000 m) 7.85 with a standard deviation of 0.79, therefore, post-test amounted to 7.76 to standard deviation of 0.74, the arithmetic average was also in the pre-test of the speed (running in the wheelchair for 30m) 8.53

with a standard deviation of 1.22 therefore post-test amounted to 8.38 to standard deviation of 0.91. And the arithmetic average was in the pre-test of strength (throw of the medical ball) 4.24 with a standard deviation of 0.92, consequently, post-test amounted to 4.67 to the standard deviation of 0.92. While the arithmetic average was in the pre-test of dribbling between obstacles 43.5 with a standard deviation of 3.2, as a result, post-test amounted to 39.53 to the standard deviation of 2.9.

And by looking at values of the "t" calculated has ranged from 0.39 to 1.43 is less than the estimated of the t-tubular 2.26, to a degree of freedom (n-1) = 9, and the level of significance is 0.05, and therefore here are no statistically significant, however we note a slight improvement in the after effects compared with the tribal results in the arithmetic average control sample, except the dribbling test, Where "t" was calculated 3.83 and is larger than the value of the t-tabular (Table 1).

The experimental had a arithmetic average was in the pre-test of endurance 7.81 to standard deviation of 0.99, thus, post-test amounted 7.15 to standard deviation of 0.82, And arithmetic had a mean in the pre-test of speed 8.56 to standard deviation of 1.11 thus post-test amounted 7.82 to standard deviation of 0.7, And arithmetic average was in the pre-test of strength 4.30 to standard deviation of 0.84 therefore post-test amounted 5.01 to standard deviation of 0.81. While the arithmetic average was in the pre-test of dribbling 41.02 with a standard deviation of 3.12 as a result post-test amounted to 37.85 to the standard deviation of 2.8.

And by looking at values of the t calculated has ranged from 2.2 to 3.23 and it is the larger than estimated of the t-tubular 2.26, to a degree of freedom 9 and the level of

significance is 0.05 and therefore there are statistically significant in favour of post-test in the experimental sample (Table 2).

Comparison of dimensional results

Illustrated by Table 3 above all values t calculated that come between 2.10 as the smallest value and 2.44 as the largest value is greater than the value of T tabular which reached 2.10 at degree freedom 18, level of indication 0.05 which the differences between the averages of any differences between the averages of statistical significance, except the strength test, Where t was calculated 1.43 and is smaller than the value of the table t (Table 3).

Discussion

According to the researchers in the Table 2, there are significant statistical differences in the pre-test and post-test in the experimental sample in the elements of physical performance under study (endurance, speed, strength, etc.). This result was the result of the proposed training program based on scientific foundations of the application of physical and motor exercises of quality that are related to the game, especially the use of the Weighted basketball balls. Such as running drills with the ball, dribbling and conversation, run the ball with a shot. This result is in line with they found Kelley & Freiden (1980), DePauw & Gawron (1995), and Knechtle & Köppli (2001). The training program for persons with disabilities should comprise the five major physical abilities which are endurance, flexibility, coordination, strength, and speed .

Table 1
Comparing the results of tests of the control sample.

Sample	Post-test		Pre-test		t	p
	Mean	SD	Mean	SD		
Endurance test	7.76	0.74	7.85	0.79	0.4	P > 0.05
Speed test	8.38	0.91	8.53	1.22	0.43	P > 0.05
Strength test	4.67	0.92	4.24	0.92	1.43	P > 0.05
Dribbling test	39.53	2.9	43.5	3.2	3.83*	P < 0.05

Table 2
Comparing the results of tests of the sample experimental.

Sample	Post-test		Pre-test		t	p
	Mean	SD	Mean	SD		
Endurance test	7.81	0.99	7.15	0.82	2.26*	P < 0.05
Speed test	8.56	1.11	7.82	0.7	2.46*	P < 0.05
Strength test	4.30	0.84	5.01	0.81	2.53*	P < 0.05
Dribbling test	41.02	3.12	37.85	2.8	3.23*	P < 0.05

Table 3

Compare the results after tests between experimental and control samples.

Sample	Control		Experimental		t	p
	Mean	SD	Mean	SD		
Endurance	7.76	0.74	7.15	0.82	2.44*	P < 0.05
Speed	8.38	0.91	7.82	0.7	2.11*	P < 0.05
Strength	4.67	0.92	5.01	0.81	1.4	P > 0.05
Dribbling	39.86	2.9	37.85	2.8	2.10*	P < 0.05

This consists of the study of Skucas (2012) that anaerobic endurance refers to the ability to perform intense work without oxygen, and it is a very important feature in wheelchair basketball. This physical feature enables the disabled wheelchair basketball player to seek for maximum results on the basketball court in shorter, medium and long distances. The research's results show that the wheelchair basketball program improved the anaerobic endurance of disabled wheelchair basketball players, however, obvious improvement in comparison to the control group was observed only in eight weeks of training with weighted basketball balls.

This is confirmed by Gibbons & Bushakra (1989) participation in sports by individuals with developmental disabilities can lead to increases in self-esteem, independence and improved physical fitness. And Davis & Sherrill (2004) Adds Fundamental wheelchair basketball skills to be trained intensively include dribbling, bounce-stop, bounce spin, catching, shot and lay-up.

Admit by Bruneli et al. (2006) in time and special attention to developing wheelchair basketball players' physical skills. Approve Bruneli et al. (2006), Molik & Kosmol (2001) in agility as refers to perform movements quickly and precisely in constantly changing situations on the court. Agreed by the researchers in the improvement of weighted basketball balls players' as an additional work which can improve this motor ability reported as a traditional method in twelve weeks according to the similar. The results coincide with the results of another researcher. Expect in the present study based on the progression of the control sample. Although. Our results are in conformity with the judgment provides by Goosey-Tolfrey (2010) that WB is a physically demanding team sport that requires a high degree of skill, technical expertise, and teamwork. Acceleration, speed, and agility are of particular importance since the game is often played at a fast pace and excellent chair and ball skills are fundamental to the game. A high level of conditioning is required to maintain work intensity and to prevent injury. This touched him Yanci et al. (2015) in his study agility, strength and endurance capacity in wheelchair basketball players.

As a summary of what has been achieved the researchers appreciate that the diversification of the content of the exercises using Weighted basketball balls improve the level of elements performance under study

[endurance, speed, strength, conversation (dribbling)], because Weighted basketball balls as a plus resistance increase strength, power flexibility, endurance and stability to have good performance on field. However. This is of great importance in possibilities of applying for wheelchair basketball programs in the investigation of the integral development of disabled person's physical and technical abilities. Appreciate in this modest study in the use of weighted basketball balls as the effective tool to improve physical performances via wheelchair basketball players.

In conclusion, researchers suggest that proposed training program using Weighted basketball has a positive impact on the physical performance of wheelchair basketball players. Approve in this study as addition task which can improve the resistance correlate to eight weeks to develop sprint training appreciate in the improvement of maximum speed phase of sprinting (20-40 meters) and resisted sprint training (pulling a sled weighted with a 5-kilogram load) related to the progress of the acceleration phase of sprinting (10 meters) associated with agility in change direction (agility).

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