

Effectiveness of Using Some Specific Exercises Similar to the Movement for Developing the Element of Power and the Level of Record Achievement for the Mentally Handicapped Runners

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Abstract: The research aims to identify the effectiveness of using some exercises similar to the movement for developing the element of power and the level of record achievements for the mentally handicapped runners. Attention to this category are due to the number of mentally handicapped which was estimated by the United Nations, that the proportion of disabled people in the world represents 10% of the population, numbering about 450 million, including 80% in the developing countries [1] and in the Egyptian society reaches to 3% and in some poor regions to 7% [2]. Through the researcher's experience in the practical field and working with this category for more than thirteen years noted that individuals with special needs (mentally handicapped) ruin to muscle strength and thus to the element of muscular power in spite of its great importance in all sports activities, both physical and skill and in terms of research and theory has not been subjected to the impact of developing such physical element in this directive manner (using elastic ropes) on the skill or record level concerning players with special needs in running competitions -within the limits of the researcher- The sample of the research was intentionally chosen of 10 athletes with special needs (mentally handicapped whom participates in 100-200m running competitions). The results indicated the following: Statistically significant improvement in the physical tests referring to the element of power, represented in: the ability of abdominal muscles test by applying as many true test, the ability of the back muscles test by applying as many true test, test of high jump from stability, test of vertical jump from stability, test of running 30 meters low start and test of running 30 meters flying start. Statistical significant improvement in the physical tests referring to the element of isometric strength, represented in leg muscles strength test by using a dynamometer and back muscles strength test by using a dynamometer. Statistical significant improvement in the physical tests referring to the element of speed endurance, represented in: leg muscles strength test by using the test of running 150 meter low start. Statistical significant improvement in the level of record achievements for the event of running 200 meter.

Key words: Directed similar specific exercises % Mentally handicapped % Power

INTRODUCTION

Recently children with special needs problems are imposed (mentally handicapped) on the international level in general and in Arab Republic of Egypt in particular and their care became one single of the societies progress, moreover is considered a standard for the economic progress where the rehabilitation of this category to be an effective productive capacity contributes to the benefit of society, thus contribute to minimizing the burden the of family the disabled individual [1].

Quoting Karl and Barry, El- Shobokshi [2] has indicated that children with special needs (mentally handicapped) often have lack of experience and motor skills, which leads to inefficiency of their mobility and thus suffer from failure in games and sports activities and in its turn leads to their rejection by their healthy peers and not selected when playing and this makes them withdraw from sports activities which require motor experiences, which in turn affects negatively on their motor skills.

Many studies have indicated that about 7% of the mentally retarded suffers from severe mental handicap and about 18% from average handicap and 75% suffer from simple handicap [3].

The physical elements are considered the fundamental basis where the possibility to exercise different sports activities is build, upon it the specific physical fitness, progress of basic skills and playing methods are built, without it the possibility of achieving these dimensions is difficult, if not impossible [4].

The results showed a statistically significant improvement in the physical tests referring to the power element due to using such method.

MATERIALS AND METHODS

The research was applied on an intentionally selected sample from the Athletics players (first-class and under 20 years old) of those with special needs (mentally handicapped) of El-Shams sports club and 6th of October club, the sample composed of 10 players participants in the events of running 100 m and 200 m.

The experimental method has been used through the pre and post measurements for two groups of individuals, one control and the other experimental, for it suits the nature of the research.

The pre-measurements were applied over the last three days before applying the proposed training program which lasted for three months, in terms of four training units per week (in the specific preparation period).

Specific exercises were applied by the elastic ropes only to the experimental group (five players). The training unit's time of 90 minutes are divided as follows: (specific training unit with elastic ropes to the experimental group):

- C 20 minutes to warm up, flexibility and general and specific stretching exercises.
- C 10 minutes of running specific training (ABC).
- C 25 minute of specific training using elastic ropes.
- C 25 minutes of physical fitness part for the development of specific physical elements.
- C 10 minutes to calm down.

How to determine the amount of resistance located on the working muscles while using the elastic ropes:

Graded signs in centimeters are placed on the ground or a measure tape (m.) to recognize the pulling distance reached by elastic rope during the performance of these exercises.

Procedure and Measurements Instruments and

Procedure: The researcher conducted the pre-measurements on the stadiums of El-Shams sports club and 6th of October club on Jan. 27, 28 & 29, 2009 in the following order:

First day: Tuesday, Jan. 27, 2009.

- C Height: through using the restameter.
- C Weight: through using an electronic medical scale.
- C Age: from the birth certificates.
- C Intelligence: through the Stanford's test (the results of these tests could be found in a special file of each player in his club as these documents are used for registration in the federation.
- C Leg muscles strength test using the dynamometer.
- C Back muscles strength test using the dynamometer.
- C The abdominal muscles power test through applying as many true test (lying on the back, bending the legs and sitting to touch the chest by the knees) in 20 seconds.
- C The ability of the back muscles test by applying as many true test (leaning on the abdomen, lifting the trunk up to touch the coach's hands which are about 20 cm above the player's shoulders and at a distance of about 50 cm from the player with fixing his feet) in 20 seconds.
- C The test of high jump from stability (To measure legs power in the horizontal direction).
- C The test of vertical jump from stability (To measure legs power in the vertical direction).
- C The test of running 30 meters from a low start (To measure speed acceleration).
- C The test of running 30 meters from a flying start (to measure maximum transaction speed).
- C The test of running 150 meters from a low start (To measure speed endurance).

Third day: Thursday, Jan. 29, 2009: Record level of running 100 m. event.

Implementation of the Program:

- C The sample was divided into two groups, one experimental group (6 October Club's Group) and the other control group (El-Shams Club's Group) each of 5 players, after conducting the statistical equivalence between the players in the pre-measurements. The training program has been

applied to the control and experimental groups during the period from 01.02.2009 to 30.04.2009, three months for applying the program as four training units per week (in the specific preparation period), where the specific exercises with the elastic ropes were applied on the experimental group (only five players).

C The researcher has established the specific similar exercises to the movement and were presented to experts and endorsed by the extent of their validity and relevance of the application and achieving the goals set for it.

Statistical Analysis: The researcher used the following statistical analysis methods: the arithmetic means - standard deviation - torsion - 'the value of Z' to calculate the significant differences between groups.

RESULTS AND DISCUSSION

Through data analysis and discussion of the results concerning measurements of the research variables, Table 1 indicates to the arithmetic mean and standard deviation of the pre and post measurement of the experimental group.

The results of the previous table indicate to the arithmetic mean and standard deviation of the pre and post measurement of the experimental group.

Table 2 illustrates the existence of significant differences between pre and post measurements for the experimental group in favor of the post-measurements in the variables of the research, which indicates that the specific directed training program applied to the experimental group led to improving the results of tests

on topics, which reflects the improvement in power as well as an improvement in the level of record achievement for running 200m event of the experimental sample individuals.

The results of the table indicate to the arithmetic mean and standard deviation of the pre and post measurement of the control group.

Table 4 illustrates the existence of significant differences between pre and post measurements for the control group in favor of the post-measurement in the variables of the research, which indicates that the applied training program to the control group led to improving the results of the tests on topics, which reflects the improvement in power as well as an improvement in the level of record achievements of the 200m event of the control sample individuals.

Table 5 illustrates the existence of significant differences between the post -measurements of the control group and the post-measurements of the experimental group in favor of the post-measurement of the experimental group in the variables of the research, which indicates that the specific training program similar to the movement by using elastic ropes applied on the experimental group led to improving the results of the tests on topics (Leg and back muscles strength test using the Dynamometer, the abdominal muscles power test, back muscles power test, the test of high jump from stability, the test of vertical jump from stability, the test of running 30 meters from a low start, the test of running 30 meters from a flying start), which reflects the improvement in power as well as an improvement in the level of record achievements of running 200m event and running 150m of the experimental sample individuals.

Table 1: The arithmetic mean and standard deviation of the pre- and post-measurements of the experimental group

Variables	Pre-measurements		Post-measurements	
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation
Record level (s)	14.8900	0.61875	14.5000	0.55678
Wide jump (m.)	1.5240	0.05595	1.7260	0.07987
Vertical jump (cm.)	13.4240	0.55869	21.8400	2.12300
Running 30m. flying start(s)	4.8600	0.09618	4.1400	0.13874
Running 30m. low start (s)	5.3640	0.28130	5.0340	0.19308
Legs muscles strength Kg	85.4000	3.84708	124.4000	11.71751
Back muscles strength Kg	69.2000	3.42053	102.2000	2.28035
Abdomen muscles power (n.)	16.2000	3.11448	23.8000	3.42053
Back muscles power (n.)	10.2000	1.09545	16.4000	2.40832
Running 150m. (s.)	26.5780	0.62151	26.5000	0.65955

Table 2: The significant differences between the pre- and post-measurements of the experimental group by using Wilcoxon

Variables	Direction	Number	Differences average	Differences sum	"Z" Value	Error possibility
Record level (s)	-	5	3.00	15.00	*2.023	0.043
	+	0	0.00	0.00		
	=	0				
	Sum	5				
Wide jump (m.)	-	0	0.00	0.00	*2.023	0.043
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Vertical jump (cm.)	-	0	0.00	0.00	*2.032	0.042
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Running 30m. flying start (s)	-	5	3.00	15.00	*2.041	0.041
	+	0	0.00	0.00		
	=	0				
	Sum	5				
Running 30m. low start (s)	-	5	3.00	15.00	*2.023	0.043
	+	0	0.00	0.00		
	=	0				
	Sum	5				
Legs muscles strength Kg.	-	0	0.00	0.00	*2.032	0.042
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Back muscles strength Kg	-	0	0.00	0.00	*2.023	0.043
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Abdomen muscles power (n.)	-	0	0.00	0.00	*2.023	0.043
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Back muscles power (n.)	-	0	0.00	0.00	*2.023	0.043
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Running 150m. (s.)	-	5	3.00	15.00	*2.023	0.043
	+	0	0.00	0.00		
	=	0				
	Sum	5				

Indexed "z" value at the level of 0.05 = 1.96

Table 3: The arithmetic mean and standard deviation of the pre and post measurement of the control group

Variables	Pre-measurements		Post-measurements	
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation
Record level (s)	15.6500	0.59367	15.5180	0.57699
Wide jump (m.)	1.4620	0.08701	1.6980	0.08729
Vertical jump (cm.)	13.2300	0.80112	18.8240	0.86202
Running 30m. flying start(s)	4.8780	0.09039	4.4700	0.33838
Running 30m. low start (s)	5.2140	0.17743	4.9860	0.08989
Legs muscles strength Kg	79.6000	3.20936	113.8000	8.04363
Back muscles strength Kg	63.0000	2.82843	86.2000	4.81664
Abdomen muscles power (n.)	14.4000	1.14018	20.0000	1.22474
Back muscles power (n.)	10.6000	1.14018	15.8000	1.92354
Running 150m. (s.)	27.3920	0.40419	27.0980	0.31428

Table 4: The significant differences between pre and post measurement of the control group by using the Wilcoxon

Variables	Direction	Number	Differences average	Differences sum	"Z" Value	Error possibility
Record level (s)	-	5	3.00	15.00	* 2.121	0.034
	+	0	0.00	0.00		
	=	0				
	Sum	5				
Wide jump (m.)	-	0	0.00	0.00	* 2.023	0.043
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Vertical jump (cm.)	-	0	0.00	0.00	*2.023	0.043
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Running 30m. flying start (s)	-	5	3.00	15.00	*2.023	0.043
	+	0	0.00	0.00		
	=	0				
	Sum	5				
Running 30m. low start (s)	-	5	3.00	15.00	*2.032	0.042
	+	0	0.00	0.00		
	=	0				
	Sum	5				
Legs muscles strength Kg.	-	0	0.00	0.00	*2.032	0.042
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Back muscles strength Kg	-	0	0.00	0.00	*2.023	0.043
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Abdomen muscles power (n.)	-	0	0.00	0.00	*2.041	0.041
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Back muscles power (n.)	-	0	0.00	0.00	*2.032	0.042
	+	5	3.00	15.00		
	=	0				
	Sum	5				
Running 150m. (s.)	-	5	3.00	15.00	*2.023	0.043
	+	0	0.00	0.00		
	=	0				
	Sum	5				

Indexed "z" value at the level of 0.05= 1.96

Table 5: The significant differences between the average of post-measurement of the experimental group and control group in the research variables

Variables	Group	Number	Average	Sum	"Z" Value	Error possibility
Record level (s)	Experimental	5	3.60	18.00	*1.984	0.047
	Control	5	7.40	37.00		
Wide jump (m.)	Experimental	5	7.80	39.00	*2.402	0.016
	Control	5	3.20	16.00		
Vertical jump (cm.)	Experimental	5	7.80	39.00	*2.402	0.016
	Control	5	3.20	16.00		
Running 30m. flying start (s)	Experimental	5	4.30	21.50	*2.193	0.028
	Control	5	6.70	33.50		
Running 30m. low start (s)	Experimental	5	3.60	18.00	*1.984	0.047
	Control	5	7.40	37.00		
Legs muscles strength Kg.	Experimental	5	8.00	40.00	*2.627	0.009
	Control	5	3.00	15.00		
Back muscles strength Kg.	Experimental	5	8.00	40.00	*2.627	0.009
	Control	5	3.00	15.00		
Abdomen muscles power (n.)	Experimental	5	7.50	37.50	*2.128	0.033
	Control	5	3.50	17.50		
Back muscles power (n.)	Experimental	5	7.50	37.50	*2.128	0.033
	Control	5	3.50	17.50		
Running 150m. (s.)	Experimental	5	4.30	21.50	*2.193	0.028
	Control	5	6.70	33.50		

Indexed "z" value at the level of 0.05= 1.96

Table 6: The changing rates of the post-measurements than the pre-measurements of the experimental group and the control group

Variables	Changing rates of the experimental group	Changing rates of the control group
Record level (s)	2.61921	0.84345
Wide jump (m.)	16.95360	16.14227
Vertical jump (cm.)	62.69368	42.28269
Running 30m. flying start(s)	14.81480	8.36408
Running 30m. low start (s)	6.15213	4.37284
Legs muscles strength (Kg.)	45.66745	42.96482
Back muscles strength (Kg.)	47.68786	36.82540
Abdomen muscles power (n.)	46.91358	38.88889
Back muscles power (n.)	60.78431	49.05660
Running 150m. (s.)	1.57273	1.07331

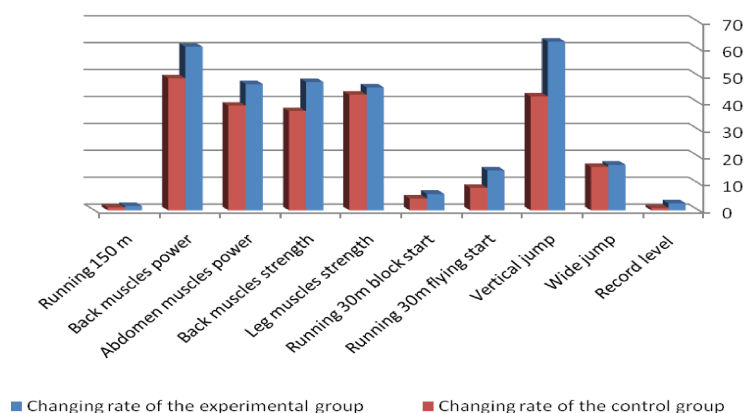


Fig. 1: The changing rates of the post-measurements than the pre-measurements of the experimental group and the control group

All of the above mentioned findings, resulted from the statistical processes conducted on the sample of the research, agrees with the results of Abdel-Hamid [5], where he confirmed that the use of specific directed exercises using alternative tools and the elastic rope leads to improving legs explosive power for the shot put from stability players and also agrees with the study of Abd El- Fattah [6] as its most important results is the positive impact of the applied program that used the elastic ropes for the first year students of Physical Education Faculty for Girls, Helwan University in improving the qualities of power, strength and record level of achievement for running 200m event.

This is consistent with Bayoumi [7] where she pointed to an improvement in the levels of muscular power and flexibility due to using ropes exercises more than the weights program for the female students of the Faculty of Physical Education for Girls in some rhythmic exercises movements. Also that was emphasized through the study of Mohammed [8], as her results led to improving the legs and arms muscular power level and the record level of shot put event for the experimental group than the control group for female students of the Faculty of Physical Education for Girls.

Moreover, results also agree with the studies results of both Mabrouk [9] and Zaki [10] as they concluded that specific training using the same muscular work and direction of the skill using elastic ropes lead to the improvement of power, speed and strength as well as the record achievements for volleyball and long jump players. That was agreed with both Hostler *et al.* [11] and Jett *et al.* [12] where they indicated that there are differences in muscle size between males and females in favor of males and the elastic ropes and elastic strips are safe and can be performed easily at any place, even at home where it does not require wide place for performance.

It also agreed with both Maiorana [13], Nelson and Fiatarona [14] and Pollock and Franklina [15] where they indicated to the importance of using specific training with assisting tools such as elastic ropes because of their impact on the skill level, as well as the development of some physical fitness components like strength, explosive power and speed.

Table 6 illustrates the existence of significant differences between the post and pre-measurements of the experimental group greater than the differences between the post and pre-measurements of the control group in the research variables, which indicates that

the specific training program similar to the movement by using elastic ropes applied on the experimental group led to improving the results of the tests on topics, which reflects the improvement in power as well as an improvement in the level of record achievements of running 200m event of the experimental sample individuals.

The results of the table illustrate the changing rates of the post-measurements than the pre-measurements of the experimental group and the control group in the research variables (Fig. 1).

CONCLUSIONS

In the light of the research objectives and the limits of the research sample and its characteristics and after citation to the statistical treatment and after presenting and discussing the results, it's concluded that the proposed training program leads to the following:

- C Statistical significant improvement in the physical tests referring to the element of power, represented in: the abdominal muscles power test by applying as many true test, the back muscles power test by applying as many true test, test of long jump from stability, test of vertical jump from stability, test of running 30 meters low start and test of running 30 meters flying start.
- C Statistical significant improvement in the physical tests referring to the element of isometric strength, relevant to developing power, represented in: leg muscles strength test by using a dynamometer and back muscles strength test by using a dynamometer.
- C Statistical significant improvement in the physical tests referring to the element of speed endurance, relevant to the improvement of the record achievements level, represented in: running 150 meter low start for measuring speed endurance.
- C Statistical significant improvement in the level of record achievements for the event of running 200 meter.

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