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THE INVESTIGATION OF THE EFFECTS TO PHYSICAL PARAMETERS OF 24 WEEKS SPECIAL MOVEMENT TRAINING PROGRAM WHICH IS APPLIED TO AUTISTIC CHILDREN WITH EUROFIT TESTS[i]

Ahmet Sirinkan[ii],
R. Nazım Saraçoğlu
Atatürk University, Sport Science Faculty,
Recreation Department, Erzurum, Turkey

Abstract:

Aim: The aim of this research is to investigate the effect to physical parameters of 24 weeks special movement training program which is applied to 8-16 aged autistic children with Eurofit tests.

Method: 18 children (6 female + 12 male) who study in special education and rehabilitation centers participated to this research. Students were grouped as 8-10 aged, 11-13 aged, 14-16 aged. For measuring the students' physical features height, age, weight and improved Eurofit tests for the disabled (**25m sprint test, flamingo balance test, test of touch to the disks, flexibility, standing long jump, paw force, 30sec. shuttle test, 30 sec. push-ups vertical jump, 10x5m shuttle run test)** were used. Pre-tests for each student were performed to get the information about the physical properties. According to these tests, 24 weeks special movement training program was prepared to improve the weak physical characteristics. Two volunteer students of sport science faculty recreation department were appointed to each student for applying the program. Volunteer students were educated with giving seminars about movement training, behavior to autism and children. Required exercise and game materials for training (various sizes and softness of balls, various sizes of pilates balls, targets, various heights of boards and obstacles, colorful balls and targets, various weights of dumbbells, various weights of medicine balls) were prepared. 40-60 minutes trainings

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[ii] Correspondence: email asirinkan@hotmail.com, nazimsaracoglu@atauni.edu.tr

were done 2 days in a week. Tests were done again in 6th, 12th and 18th week of training with saving. At the end of the 24th week, selected tests were done as a last test with comparing the other test results and evaluated. The obtained data were evaluated with interpreting and tabulated. The research results were interpreted with analyzing according to the age groups.

Findings: As a result of the work done, it is seen that 8 students (2 female + 6 male) of 8-10 aged group have significant development in student's feature of balance, flexibility, long jump and vertical jump, 5 students (2 female + 3 male) of 11-13 aged group have significant development in student's features of 25m run, balance, flexibility, vertical jump and 5 students (2 female + 3 male) of 14-16 aged group have significant development in student's features of 25m run, balance, flexibility, vertical jump, right handed paw force, 30 sec. shuttle and push-up. In general of the students who participated to the research it was not progressed in their features of 10x5m shuttle run, left handed paw force and touch to disks.

Result: As a result, it is determined that the special exercise and movement training program which was done to 8-16 aged group of autistic students is formed in the positive way to students' physical features.

Keywords: autistic, Eurofit test, movement training, exercise

1. Introduction

The significant features of autism which was defined in 1943 by Dr. Leo Kanner are global and broad language disorders, abnormal and stereotype behavioral samples, social and mostly mental disability. Autism is the primary form of PDD (Pervasive Developmental Disorder). Many autistic children show a delay in gross and fine motor skills, have difficulty in completing academic procedures in the school environment and understanding, expressing language even though it is not related with intelligence. (1)

Autistic disorder is a disorder with characterized developmental which is inadequacies in social interaction and communication located within the range of PDD with limited in behavior interest and activities, stereotyped and repetitive samples and have delays or unusual functionality at least one of the language or symbolic/image game skills before 3 years of age which is used in social interaction, social communication. (2)

Autism can be defined as a disability which is defined with behavioral indications in connection with elevated cortical functions which effects the lifelong socialization, language, communication and many activities and interest. (3)

PDD has five different subcategories (4) and autism spectrum is used as an umbrella term that covers all of them. Erstwhile, the situation we have seen rarely diagnosed is more common than childhood cancer, diabetes and Down syndrome nowadays and most common serious developmental disorder after mental retardation. (5) In last 10 years, autism cases have been increasing. It is considered that the main reason of this increasing is earlier and more accurate recognition of autism rather than proliferation of cases. Autism is now being discussed and considered more in society. (6) Sport and exercise strengthens muscles, increase and develop the coordination of hand, eye and balance in autistic children and develop autistic children's biggest problems which are social relations, communication skills. Participating to the sport and exercise program contributes self-confidence of individuals and groups of autistic child except their family.

Sport is an implement which allows autistic children to be together with people they don't know before and in place, they haven't been before with separating them from their usual restricted family life. In this way, autistic children communicate with different people and participate to exercises with certain rules. (7)

It is possible to develop basic motor skills and elimination of deficiencies with intensive and programmed sport therapies. It is aimed to put movements into a certain system with using the basic imitation skills. It is seen that autistic people prefer to follow and imitate many others rather than being a leader during the exercise and sports group events because of their little self-confidence.

It is clearly seen that even if healthy people are able to distinguish a large proportion of their time to sports, how much the individuals with autism are in need of it. In this context, one of the most important educational equipment of special education programs is sporting activities. It is important to develop not only sociological and psychological but also physiological and motoric skills at the same time. The aim of the exercise therapies is eliminating the physical disability and isolation in social interaction, disconnection from society and mental separation from individuals who have autism with mental disabilities. (8)

2. Material and Method

18 children (6 female+12 male) who study in special education and rehabilitation center participated to the research. Students grouped as 8-10 aged, 11-13 aged and 14-16 aged. **Height, weight and age** and Eurofit tests which are improved for disabled **(25m sprint test, flamingo balance test, test of touch to disks, flexibility, standing long jump, paw**

force, 30 sec shuttle test, 30 sec. push-up, vertical jump, 10x5m shuttle run test) were used to measure the students' physical properties.

Pre-tests for each student were performed to get the information about the physical properties. According to these tests, 24 weeks special movement training program was prepared to improve the weak physical characteristics. Two volunteer students of sport science faculty recreation department were appointed to each student for applying the program. Volunteer students were educated with giving seminars about movement training, behavior to autism and children.

Required exercise and game materials for training (various sizes and softness of balls, various sizes of pilates balls, targets, jumpers, various heights of boards and obstacles, colorful balls and targets, various weights of dumbbells, various weights of medicine balls) were prepared.

3. Analysis

40-60 minutes trainings were done 2 days in a week. Pre-tests were done with saving in the first week of exercises. At the end of the 24th week, selected tests were done as a last test with comparing the other test results and evaluated. The obtained data were evaluated with interpreting and tabulated. The research results were interpreted with analyzing according to the gender (female-male) groups.

Table 1: Special Prepared Movement Training Education Program

Weeks	Basic Movements	Special Movements	Gains	Used Materials
1.and 2. Week (2 working)	Gross motor skills	Walking, running, jumping.	To be able to walk in balance, run and jump.	Flat ground, on the rope, Gymnastic bench, balance board.
3.and 4. Week (2 working)	Subject control skills	Holding, grip, throw.	To be able to hold things right and accurate, grip and throw.	Sponge, ottoman, various size of medicine balls.
5.and 6. Week (2 working)	Ball exercises	Holding with hand and throwing, Holding with foot and hitting, throwing to the target.	To be able to hold the various size and weight of balls, control and throw.	Various size, weight and hardness of balls which belongs to sport branches.
7.and 8. Week (2 working)	Ball exercises	Ball throwing to target with hand and foot.	To be able to hold the various size and weight of balls with both hand and foot, control and throw.	Various size, weight and hardness of balls which belongs to sport branches.
9.and 10. Week (2 working)	Gymnastics exercises	Rolling, climbing, walking in balance, leap.	To be able to roll correctly and in balance, climb, walk in balance and leap.	Gymnastic mat, bench, trampoline, parallel, pull up.
11.and 12. Week (2 working)	Gymnastics exercises	Rolling, climbing, walking in balance, leap.	To be able to roll correctly and in balance, climb, walk in balance and leap.	Various size, weight and hardness of balls which belongs to sport branches.
13.and 14. Week (2 working)	Sport games (double, triple groups)	Dribbling in basketball, shoot, pass. Dribbling in football, shoot, pass.	To be able to perform skills specific to the sport branch in accordance with the technique.	Various size of balls which belongs to sport branches.
15.and 16. Week (2 working)	Sport games (double, triple groups)	Sportive educational games, group activities.	To be able to play games with matched and grouped, comply with the rules.	Educational game materials (rope, circle, funnel, step, etc.)
17.and 18. Week (2 working)	Ball exercises	Ball throwing to target with hand and foot.	To be able to hold the various size and weight of balls with both hand and foot, control and throw.	Various size, weight and hardness of balls which belongs to sport branches.
19.and 20. Week (2 working)	Gymnastics exercises	Rolling climbing, walking in balance, leap.	To be able to roll correctly and in balance, climb, walk in balance and leap.	Various size, weight and hardness of balls which belongs to sport branches.
21.and 22. Week (2 working)	Sport games (double, triple groups)	Dribbling in basketball, shoot, pass. Dribbling in football, shoot, pass.	To be able to perform skills specific to the sport branch in accordance with the technique.	Various size of balls which belongs to sport branches.
23.and 24. Week (2 working)	Sport games (double, triple groups)	Sportive educational games, group activities.	To be able to play games with matched and grouped, comply with the rules.	Educational game materials (rope, circle, funnel, step, etc.)

Special prepared movement education program which is in Table.1 was planned in view of children's properties of gross motor skills and subject control skills. During the preparation of implementation plan, it was designed with view of special education department faculty members and faculty members of sport science, physical education and sports teacher department. The contents of the program consist of skills of walking, running, jumping, holding, gripping, throwing, holding and throwing with hand, holding and hitting with foot, throwing to the target, ball throwing to the target with hand and foot, rolling, climbing, walking in balance and leap.

During the implementation, it is aiming to increase the motivation of children with using sporting material as much as possible. Also, recognition of different sporting materials and teaching how to use them was aimed. (Table 1)

Table 2: The condition of gender, age, height and weight of subjects' who participated to the research

Condition		**N**	**%**
Gender	Male	12	66
	Female	6	34
Age	8-10 age	7	38,8
	11-14 age	7	38,8
	15-16 age	4	22,4
Height	115-134 cm.	6	34
	138-149 cm.	7	38,8
	161-169 cm.	5	27,2
Weight	30-38 kg	5	27,2
	42-55 kg	7	38,8
	57-65 kg	6	34

In Table 2, the conditions of gender, age, height and weight of children's who participated to the research is indicated. Students who participated to the movement education program occur with 12 male (%66) and 6 female (%34).

7 of students are aged between 8-10 (%38,8), 7 of them are aged between 11-14 (%38,8) and 4 of them are aged between 15-16 (%22,4).

6 of students' height are between 115-134cm (%34), 7 of students' height are138-149cm (%38,8) and 5 of students' height are161-169cm (%27,2).

5 of students' who participated to the research weight are between 30-28kg (%27,2), 7 of students' weight are between 42-55kg (%38,8) and 6 of students' weight are between 57-65kg (%34). (Table 2)

Table 3: The condition of Pre test - Post test of male students who participated to the research

Tests	**Male**	**N**	**Minimum**	**Maximum**	**Ss**	**P Values (P<0,001)**
25 m Spin Test	Pre-test	12	3,55	6,25	-3,726	,000
	Post-test	12	3,13	5,45		
Flamingo Balance Test	Pre-test	12	16	38	-3,740	,000
	Post-test	12	21	46		
Test of Touch to Disks	**Pre-test**	**12**	**7,10**	**11**	**-1,127**	**,642**
	Post-test	**12**	**7,05**	**10,90**		
Flexibility Test	Pre-test	12	2,15	6,55	-3,727	,000
	Post-test	12	4,45	8,15		
Standing Long Jump Test	Pre-test	12	25	65	-3,740	,000
	Post-test	12	34	75		
Right Hand Grip Test	Pre-test	12	23	65	-3,744	,000
	Post-test	12	32	72		
Left Hand Grip Test	**Pre-test**	**12**	**21**	**55**	**-,110**	**,912**
	Post-test	**12**	**19**	**53**		
30 Sec Shuttle Test	Pre-test	12	5	10	-3,835	,000
	Post-test	12	7	12		
30 Sec Push-Up Test	Pre-test	12	3	7	-3,816	,000
	Post-test	12	5	9		
Vertical Jump Test	Pre-test	12	12	25	-3,775	,000
	Post-test	12	15	28		
10x5m Shuttle Run Test	Pre-test	12	15	28	-3,766	,000
	Post-test	12	16	24		

In table 3, the condition of pre-test and post-test results and significance of male students who participated to the research are indicated.

The significant (p< 0,001) results weren't achieved only in 2 test batteries (Left Hand Grip Test and Test of Touch to Disks) of 11 test batteries (25m Spin Test, Flamingo Balance Test, Flexibility Test, Standing Long Jump Test, Right Hand Grip

Test, 30sec Shuttle Test, 30sec Push-Up Test, Vertical Jump Test, 10x5m Shuttle Run Test). (Table 3)

Table 4: The condition of Pre test - Post test of female students who participated to the Research

Tests	Female	N	Minimum	Maximum		Z Values
25 m Spin Test	Pre-test	6	4,55	7,25	-16706	,000
	Post-test	6	3,13	6,45		
Flamingo Balance Test	Pre-test	6	19	42	-2,770	,000
	Post-test	6	28	56		
Test of Touch to Disks	**Pre-test**	**6**	**9,10**	**13**	**-1,165**	**,642**
	Post-test	6	9,05	12,95		
Flexibility Test	Pre-test	6	5,15	8,55	-2,730	,000
	Post-test	6	7,45	11,15		
Standing Long Jump Test	Pre-test	6	15	35	-1,745	,000
	Post-test	6	25	45		
Right Hand Grip Test	**Pre-test**	**6**	**18**	**35**	**-2,324**	**,417**
	Post-test	**6**	**19**	**38**		
Left Hand Grip Test	**Pre-test**	**6**	**15**	**27**	**-,210**	**,512**
	Post-test	**6**	**16**	**29**		
30 Sec Shuttle Test	**Pre-test**	**6**	**5**	**9**	**-3,835**	**,625**
	Post-test	**6**	**6**	**10**		
30 Sec Push-Up Test	**Pre-test**	**6**	**3**	**5**	**-2,810**	**,120**
	Post-test	6	5	8		
Vertical Jump Test	Pre-test	6	10	20	-2,745	,000
	Post-test	6	15	25		
10x5m Shuttle Run Test	**Pre-test**	**6**	**18**	**28**	**-0,736**	**,435**
	Post-test	6	17	27		

In table 4, the condition of pre-test and post-test results and significance of female students who participated to the research are indicated.

The significant ($p<0,001$) results weren't achieved in 6 test batteries (Test of Touch to Disks, Right Hand Grip Test, Left Hand Grip Test, 30sec Shuttle Test, 30sec Push-Up Test, 10x5m Shuttle Run Test) of 11 test batteries (25m Spin Test, Flamingo Balance Test, Flexibility Test, Standing Long Jump Test, Right Hand Grip Test, 30sec Shuttle Test, 30sec Push-Up Test, Vertical Jump Test, 10x5m Shuttle Run Test). (Table 4)

At the interview with student's families whose participated to the research the following comments were made.

According to male students' families' view;

1. Children were willing to participate to the exercises.
2. They waited impatiently the working days (Saturday, Sunday)
3. They were more calm and happy at nights of working days.
4. They wasted time compatible with their siblings.
5. They were eating their meal more calm and orderly.
6. They were calmer at home and their nervousness decreased.
7. They were more calm and peaceful than as usual at rest.
8. They stated that kınd of activities should be continuous and be more days in a week.

According to female students' families' views;

1. Children were willing but **hesitant** to participated to the exercises.
2. They waited impatiently the working days (Saturday, Sunday)
3. They were more **tired** but happier at nights of working days.
4. They wasted time compatible with their siblings.
5. They were eating their meal more calm and orderly but **more**.
6. They wasted their time **more** than usual.
7. They wanted that girls and boys practice in **separate** hours.
8. They wanted that volunteers occur with **female**.
9. They stated that kınd of activities should be continuous and be more days in a week.

4. Findings and Evaluation

According to the research results, it can be said that special exercise and movement education program which is applied to 8-16 aged group of autistic students was made significant development to children's physical properties.

Regarding this study, researchers who defend that physical activities contribute more to emotional and psychomotor development in disabled (8,9), emphasized that

sporting events are an important implement for supplying the disabled individual requirements of enjoyment, pleasure from moving and achievement.

In our research, parental interviews support the research results which are children are participating to the activities with pleasure and in working days seem more calm and happier.

It is highlighted that autistic children who participated to the sport education program realized their own body, started to do activities outside of their own routine life, had new friends, were physically developing because of that they feel happy. (10)

Students who participated to the movement education program seem happy on their working days and after the working, they have physically significant development parallel to the research done.

In research which was done by Biçer and friends (11), they have stated that development was observed in 2 days, 2 days in a week exercises to mentally disabled children's skills of standing long jump, vertical jump, hand paw force, shuttle and push-up.

In the special movement training program which have implemented, development of children's this properties parallel to study.

In İlhan's study (12), physical education and sport activities ensure to control autistic individual's emotions of the mood they are in because of their discomfort and the aggression, the anger and the inward closure that emerge as the nature outcome of the attitudes of the society towards them.

Families' views about children are the same in our research with İlhan's study (12). According to the findings in interviews with children's who participated to sports activities families, it has been detected that there is significant development and change in children's mentally, social life skills, motoric, problem behavior, daily life skills, sport branch and in families' mentally emotional and in many areas of socialization. (15)

In parental views in our research, it was expressed that in activities children communicate with volunteer students contributes to socialize and parental pleasure in having enough materials and physical environment in our study.

As a result, in our research, it is achieved that movement education program which is applied to autistic children contributes positively to children's physical, social and psychological development.

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