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## **Investigation of the Development of Basic Skills of Girls and Boys in Special Movement Education Applied to Primary School Students with Down syndrome**

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### **Abstract**

**Purpose:** To investigate the development of special movement training applied to primary school students with Down syndrome in the basic skills of girls and boys.

**Materials and Methods:** Twelve male and 10 female students with down syndrome were selected for the study. Students were selected from the 6-9 age group. For the research, a specially prepared movement training program was applied with the permission of the parents. The special movement training program to be applied in the research was created by the instructors of the special education department and the physical education and sports department. Special movement training program, basic motor skills (walking, running, jumping, bouncing, bouncing with standing long jump, throwing the ball, holding the thrown ball, hitting the thrown ball with the shuttlecock and hitting the ball with the foot) Research 4 months, 8 weeks, 4 days a week and each run was performed for 40-50 minutes.

**Analysis:** Before starting the research, the children were pre-tested. At the end of the research process, a post-test was made and compared. In addition, an observation form was prepared. The observation form consisted of 8 questions. The first data on the observation form were obtained when the studies were first started. At the end of the study, observation data were re-acquired. The results of 2 observations were interpreted, analyzed and reported. The research analysis was analyzed in the SPSS.16 program. In the comparison of boys and girls, Mann-Whitney U, Wilcoxon W and Z values were taken and interpreted.

**Conclusion and Evaluation:** At the end of the study, an improvement was observed in the basic skills of male students at a rate of  $p>0.001$ , while an improvement in the basic skills of female students at a rate of  $p>0.05$  was observed. According to this result, it was concluded that the development of male students in the special movement training program was higher than that of female students.

**Keywords:** Down syndrome, Movement Training, Basic Skills

### **Entrance**

Down syndrome is the most recognized genetic condition associated with intellectual disabilities. One in 733 children is born with Down syndrome (National Down Syndrome Society, 2010a). About 5,000 such children are born each year in the United States. Although the father is genetically responsible for the abnormality in about 25 percent of all cases, women over the age of 35 have the highest risk (1 in 300) of having a child with Down syndrome. At age 40, the risk increases to 1 in 110 births, and at age 45, the risk is 1 in 35 births (National Down Syndrome Society, 2010a).

### **Reasons**

Down syndrome is caused by one of three chromosomal abnormalities. The most common cause is trisomy 21, so named because of the presence of an extra chromosome 21. This results in a total of 47 chromosomes instead of the normal 46 (23 chromosomes are inherited from each parent). A second cause of down syndrome is failure to divide during meiotic cell division, resulting in 24 chromosomes in one haploid cell and 22 in the other. A third and rare cause of Down syndrome is translocation, which occurs when two chromosomes grow together; they look like one chromosome but contain the genetic material of two chromosomes (Winnick, 2011) [5].

### What Are the Common Symptoms of Down Syndrome?

The symptoms of Down syndrome vary from person to person, and people with Down syndrome may experience different problems at different periods of their lives.

#### Physical symptoms

Common physical symptoms of Down syndrome include (Bull, 2011) <sup>[1]</sup>.

- Decreased or weak muscle tone
- Short neck, excess skin on the back of the neck
- Flattened facial profile and nose
- Small head, ears and mouth
- Upward slanting eyes, usually with a fold of skin arising from the upper eyelid and covering the inner corner of the eye
- White spots on the colored part of the eye (called Brushfield spots)
- Broad, short hands with short fingers
- A single, deep wrinkle in the palm
- A deep groove between the first and second toes.

#### Materials and Methods

12 male and 10 female students with Down syndrome were determined for the research. Students were selected from the 6-9 age group. For the research, a movement training program was implemented with permission from the

students' parents. The movement training program to be applied in the research was created by the special education department and the faculty members of the Faculty of Sports Sciences, Department of Recreation. Special movement training program, basic motor skills (walking, running, jumping, hopping, standing long jump and bouncing the ball, throwing the ball, catching the thrown ball, hitting the thrown ball with the shuttlecock and kicking the ball with the foot) Research 4 months, 8 weeks, 4 days a week and each study was performed for 40-50 minutes.

Before starting the research, a pre-test was given to the children. At the end of the research process, a post-test was performed and compared. Additionally, an observation form was prepared. The observation form was created from 8 questions. The first data on the observation form were obtained when the studies first started. At the end of the study, observation data were taken again. The results of the two observations were interpreted, analyzed and reported.

#### Analysis

In the research program, the data of boys and girls were analyzed with the SSPS.16 program. When comparing boys and girls, Mann-Whitney U, Wilcoxon W and Z values were compared and interpreted.

#### Bulgular

**Table 1:** Araştırmaya katılan öğrencilerin boy, kilo, yaş ve cinsiyet durumları

Erkek Öğrenciler					
	N	Minimum	Maximum	Mean	Std. Deviation
Yaş	12	10,00	12,00	11,0000	,85280
Boy	12	125,00	135,00	129,0833	3,52803
Kilo	12	25,00	55,00	35,2500	10,48050
Kız Öğrenciler					
	N	Minimum	Maximum	Mean	Std. Deviation
Yaş	10	10,00	12,00	11,1000	,87560
Boy	10	125,00	135,00	129,7000	3,52924
Kilo	10	26,00	55,00	43,5000	10,49074

**Table 2:** Araştırmaya katılan Erkek Öğrencilerin Ön Test ve Son Test Durumları

	N	Mean	Std. Deviation	Minimum	Maximum
Yürüme ön test	12	7,8458	,48310	7,10	8,55
Koşma ön test	12	4,8583	,46163	4,15	5,50
Sıçrama ön test	12	30,0000	4,76731	25,00	35,00
Sekme ön test	12	5,5000	,90453	4,00	7,00
Uzun atlama ön test	12	65,4167	14,05482	40,00	85,00
Top sektirme ön test	12	4,1667	,71774	3,00	5,00
Top fırlatma ön test	12	17,4167	2,31432	15,00	22,00
Top tutma ön test	12	2,9167	,66856	2,00	4,00
Raketle vurma ön test	12	3,9167	,66856	3,00	5,00
Ayakla vurma ön test	12	3,7500	,75378	3,00	5,00
Yürüme son test	12	6,6333	,35569	6,05	7,10
Koşma son test	12	4,3292	,31149	4,00	5,10
Sıçrama son test	12	30,8333	4,68718	25,00	40,00
Sekme son test	12	8,0833	,90034	6,00	9,00
Uzun atlama son test	12	85,8333	12,76240	65,00	100,00
Top sektirme son test	12	6,6667	,88763	5,00	8,00
Top fırlatma son test	12	21,5000	2,61116	18,00	25,00
Top tutma son test	12	5,7500	,75378	5,00	7,00
Raketle vurma son test	12	6,6667	,98473	5,00	8,00
Ayakla vurma son test	12	6,2500	,62158	5,00	7,00

**Table 3:** Araştırmaya katılan Kız Öğrencilerin Ön Test ve Son Test Durumları

	N	Mean	Std. Deviation	Minimum	Maximum
Yürüme ön test	10	8,9400	,36040	8,50	9,40
Koşma ön test	10	5,7650	,41703	5,25	6,25
Sıçrama ön test	10	17,0000	5,37484	10,00	25,00
Sekme ön test	10	3,7000	,94868	2,00	5,00
Uzun atlama ön test	10	49,0000	10,74968	35,00	65,00
Top sektirme ön test	10	2,5000	,70711	2,00	4,00
Top fırlatma ön test	10	14,5000	2,36878	12,00	19,00
Top tutma ön test	10	3,1000	,73786	2,00	4,00
Raketle vurma ön test	10	2,9000	,56765	2,00	4,00
Ayakla vurma ön test	10	2,2000	,42164	2,00	3,00
Yürüme son test	10	8,3450	,17709	8,10	8,55
Koşma son test	10	5,6000	,44410	5,00	6,05
Sıçrama son test	10	20,0000	5,27046	15,00	30,00
Sekme son test	10	4,8000	1,03280	3,00	6,00
Uzun atlama son test	10	58,5000	10,55409	45,00	75,00
Top sektirme son test	10	3,5000	,97183	3,00	6,00
Top fırlatma son test	10	16,7000	3,23351	14,00	23,00
Top tutma son test	10	3,8000	,78881	3,00	5,00
Raketle vurma son test	10	3,7000	,67495	3,00	5,00
Ayakla vurma son test	10	2,9000	,56765	2,00	4,00

**Table 4:** Araştırmaya Katılan Kız ve Erkek Öğrencilerin ön test ve son test Durumları

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
Yürüme ön test	2,500	80,500	-3,805	,000	,000 <sup>b</sup>
Yürüme son test	,000	78,000	-3,974	,000	,000 <sup>b</sup>
Koşma ön test	7,500	85,500	-3,470	,001	,000 <sup>b</sup>
Koşma son test	1,500	79,500	-3,876	,000	,000 <sup>b</sup>
Sıçrama ön test	5,000	60,000	-3,721	,000	,000 <sup>b</sup>
Sıçrama son test	8,500	63,500	-3,468	,001	,000 <sup>b</sup>
Sekme ön test	10,000	65,000	-3,407	,001	,000 <sup>b</sup>
Sekme son test	1,500	56,500	-3,928	,000	,000 <sup>b</sup>
Uzun atlama ön test	21,000	76,000	-2,597	,009	,009 <sup>b</sup>
Uzun atlama son test	7,000	62,000	-3,525	,000	,000 <sup>b</sup>
Top sektirme ön test	8,000	63,000	-3,552	,000	,000 <sup>b</sup>
Top sektirme son test	3,000	58,000	-3,867	,000	,000 <sup>b</sup>
Top fırlatma ön test	20,000	75,000	-2,672	,008	,007 <sup>b</sup>
Top fırlatma son test	14,000	69,000	-3,050	,002	,002 <sup>b</sup>
Top tutma ön test	51,500	129,500	-,620	,535	,582 <sup>b</sup>
Top tutma son test	5,000	60,000	-3,730	,000	,000 <sup>b</sup>
Raketle vurma ön test	17,000	72,000	-3,060	,002	,003 <sup>b</sup>
Raketle vurma son test	,500	55,500	-3,990	,000	,000 <sup>b</sup>
Ayakla vurma ön test	5,000	60,000	-3,804	,000	,000 <sup>b</sup>
Ayakla vurma son test	,000	55,000	-4,101	,000	,000 <sup>b</sup>

The results of the 1st Observation made at the beginning of the research and the 2nd Observation made in the last week are tabulated. According to the results of the observation forms made for each student, in general; while poor results were seen in the 1st observation regarding the children's communication with the instructors and their facial expressions, the 2nd observation conducted at the end of the study revealed a very good improvement in their communication with the instructors.

### Conclusion and Evaluation

As a result of the research, an improvement of  $p > 0.001$  in the basic skills of male students was observed, while an improvement of  $p > 0.05$  was observed in the basic skills of female students. According to this result, it was concluded that the development of male students in the special movement training program was higher than that of female students.

In scientific studies; DS has long been recognized as a highly prevalent disorder whose most prominent symptom is

intellectual disability. But the truth is that there are also specific problems in the area of motor development that have long been overlooked, such as imbalance or lack of body rotation and abnormal movement patterns.

He stated that the child with DS is disabled in terms of motor abilities rather than mental abilities. On 47 children with DS; conducted a longitudinal study with an equal number of nondisabled control children of matched gender, age, and social class. During the first two years, she tested each child five times using the Bayley Infant Scale of Mental and Motor Development (at 6 weeks, 6 months, 10 months, 15 months, and 24 months). Scores in both the mental and motor domains of children with DS decreased sharply between the 6th and 10th months, compared to the scores of children without disabilities. While the mental score decreased gradually until the 24th month, the motor score continued to decrease in the same way in the 15th month. Then it remained unchanged in Months 15 and 24. From six months onwards, the average motor score was lower than the average mental score<sup>[6]</sup>.

They consult the works of many authors who have investigated and described the motor characteristics of people with intellectual disabilities. He writes that the pace of abilities acquired during motor development is clearly slower, but the order of emergence is the same as that of normal children's motor development, but this results in developmental delay. The mentally retarded child often has problems with fine motor skills (coordination, manipulation). They claim to have more problems performing complex motor tasks. Other authors describe problems with eye-hand coordination, dexterity, and reaction speed. Another important question is whether the average motor conditions described above are observed in every mentally retarded person or whether the movement quality of people with DS shows syndrome-specific characteristics<sup>[7]</sup>.

In another study<sup>[8]</sup>, no statistical difference was observed in the motor skills of boys and girls with Down syndrome. Development is at the same rate in both genders. Physical and rehabilitation programs implemented starting from childhood can provide significant improvements in motor skills.

In a study investigating developmental differences between age groups<sup>[9]</sup>, none of the children showed any improvement in all gross motor functions. In the study, it was found that 10% of the children in the first age group (<3 years old) and 95% of the children between the ages of 3-6 were able to stand. Similarly, it was emphasized that the walking ability of 10% of children under 3 years of age and 95% of children between 3-6 years of age improved. A statistically significant correlation was observed between walking, running and jumping.

## References

1. Bull MJ, The Committee on Genetics. Health supervision for children with Down syndrome. *Pediatrics*. 2011; 128:393-406.
2. Ulrich DA, Burghardt AR, Lloyd M, Tiernan C, Hornyak JR. Physical activity benefits of learning to ride a two-wheel bicycle for children with Down syndrome: A randomized trial. *Physical Therapy*. 2011; 91:1463-1477.
3. Martin GE, Klusek J, Estigarribia B, Roberts JE. Language characteristics of individuals with Down syndrome. *Topics in Language Disorders*. 2009; 29(2):112-132.
4. Block ME. A teacher's guide to including students with disabilities in regular physical education (3rd ed.) Baltimore: Paul H. Brooks, 2007.
5. Winnick JP. *Adapted Physical Education and Sport* (fifth Edition). Printed in the United States of America, 2011.
6. Lauteslager PEM. *Motor Development and Intervention in Children with Down Syndrome* Translated by: Bala Toprak, Baski Evi Matbaa, this research was supported by "Sticting Steunfonds 's Heeren Loo", Amersorrt, Netherlands, 2004.
7. Connolly BH, Michael BT. Performance of retarded children, with and without Down's syndrome, on the Bruininks Oseretsky test of motor proficiency. *Physical Therapy*. 1986; 66:344-348.
8. Memisevic H, Macak A. Fine Motor Skills in Children with Down Syndrome. *Specijalne Edukacija Rehabilitaciji*, Vol. 13.Br. 4, 365-377, Beograd, 2014.

9. Malak R, Kostiukow A, Wasielewska A, K., Mojs E, Samborskin W. Delay in Motor Development in Children with Down Syndrome, *Medical Sciences Monitar*. 2015; 21:1904-1910.