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KAYNAŞTIRMA ÖĞRENCİLERİNDE EGZERSİZİN MOTOR BECERİLER ÜZERİNE ETKİSİNİN İNCELENMESİ

Öz

Amaç: Bu çalışma, kaynaştırma öğrencilerinde egzersizin motor beceriler üzerine etkisini incelemek amacıyla yapılmıştır.

Metot: Çalışmaya Batman da bulunan kamu ya bağlı ilkök ve ortaokullarından yaşları 7-12 arası değişen ve sedanter 30 erkek kaynaştırma öğrencisi katılmıştır. Katılımcılara 16 hafta boyunca haftada 2 gün 60 dk egzersiz programı uygulanmıştır. Egzersiz sonucu motor becerilerinin belirlenmesi için Bruininks-Oseretsky motor yeterlik testi (BOT-2) uygulanmıştır. Çalışmada katılımcıların denge puanları, ikili koordinasyon, üst ekstremite koordinasyon, ince motor doğruluk ve bütünleştirme puanları ilk ve son testlerindeki değişimlerdeki farkları belirlemek için bağımlı örneklem t testi kullanılmıştır.

Bulgular: Egzersiz programı öncesindeki boyları ile egzersiz programı sonrasındaki boyları, egzersiz programı öncesindeki ağırlıkları ile egzersiz programı sonrasındaki ağırlıkları arasında anlamlı bir farklılık tespit edilmemiştir. Egzersiz programı öncesi ve sonrasındaki denge puanları, ikili koordinasyon, üst ekstremite koordinasyon, ince motor doğruluk ve bütünleştirme puanları arasında anlamlı bir farklılık tespit edilmiştir.

Sonuç: 16 haftalık egzersiz programının kaynaştırma öğrencilerin denge, ikili koordinasyon, üst ekstremite koordinasyon, ince motor doğruluk ve ince motor bütünleştirme parametrelerinde anlamlı farklılıklar bulunmuştur.

Anahtar Kelimeler: Kaynaştırma, Motor Beceri, Egzersiz

INVESTIGATION OF THE EFFECT OF EXERCISE ON MOTOR SKILLS IN INCLUSIVE STUDENTS

Abstract

Aim: The aim of this study was to investigate the effect of exercise on motor skills in inclusive students.

Method: Thirty male inclusive students aged between 7-12 years in public or elementary and secondary schools in Batman participated in the study. Participants were given 60 min exercise program 2 days a week for 16 weeks. Bruininks-Oseretsky motor competence test (BOT-2) was used to determine motor skills after the exercise. In the study, dependent sample t test was used to determine the differences in the balance scores, dual coordination, upper extremity coordination, fine motor accuracy and integration scores in the first and last tests.

Results: There was no significant difference between the height before the exercise program and the height after the exercise program, the weights before the exercise program and the weights after the exercise program. A significant difference was found between balance scores, dual coordination, upper extremity coordination, fine motor accuracy and integration scores in the before and after exercise program.

Conclusion: The 16-week exercise program provided significant differences in terms of balance, dual coordination, upper extremity coordination, fine motor accuracy and fine motor integration parameters in inclusive students.

Keywords: Inclusive, Motor Skill, Exercise

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1. INTRODUCTION

Inclusive students have different disability of fine and gross motor skills. It is emphasized that motor problems seen in these children are usually related to coordination skills. In addition, motor activity to perform a movement is reported to be more inadequate compared to peers with normal development (Beverdort et al., 2001; Piek & Dyck, 2004; Çakıroğlu & Sökmen, 2012; Demirci, 2009; Topsaç, 2013; Özgür, 2011). In this context, it is emphasized that it is important to include exercise programs that support basic motor skills in the education programs prepared for inclusive students. In this way, it is reported that it will be more important for students to gain mobility experience, recognize their environment and adaptation. In addition, it is emphasized that exercise programs can be used to develop children's ability to solve the problems they face, to help them search for alternative ways and creative solutions to express themselves, and to develop their basic abilities such as focusing and attention development (Berninger & Rutberg, 1992; Eichstaedt & Lavay, 1992; Attwood, 1998; Ryoichiro et al., 2000; Eichstaedt & Lavay, 1992).

Exercise is a subgroup of physical activity and the planned repetitive can be defined as body movements aimed at improving one or more components of physical fitness

Exercise is a planned, conscious, activity that aims to improve the elements of physical fitness (cardiovascular fitness, muscle strength and endurance, flexibility and body posture). In other words, exercise; fitness, physical performance, weight control, health and so on. it is a set of targeted, planned physical activities (Tekin, 2016; Thompson et al., 2009).

2. METHOD

Thirty male inclusion students aged between 7-12 and sedentary participated in the study. Participants were given 60 minutes exercise program for 16 weeks, 2 days a week. The exercise program included warm-up movements, station, balance, jump, walking over the obstacle, step board, educational games, visual and auditory reaction games. Motor competence of the participants was evaluated with Bruininks Oseretsky Motor Competence Test Battery (BOT-2).

Bruininks Oseretsky Motor Efficiency Test Battery BOT-2 revised version of the first version developed by Bruininks-Oseretsky in 1978 (Bruininks, 1978). BOT-2 is a test battery used by therapists and researchers to evaluate children's motor skills, to prepare and evaluate motor development programs, to detect and evaluate various motor function disorders and developmental disabilities (Deitz et al.,

2007). The first version of the Bruininks-Oseretsky Motor Competence Test (BOMYT) was developed by Bruininks-Oseretsky between 1973-1978 to measure the motor functions of children aged 4.5–14.5 years. A total of 765 children (379 boys and 386 girls) aged 4.5–14.5 years (white, black and other races) reflecting American society were included in the study. The whole test consists of 46 items.

3. RESULTS

The changes in the participants' first and last tests after sixteen weeks of exercise are as follows;

Table 1. First test - last test according to height and weight of the men participating in the study results

Anthropometric Measurement	N	X	SS	P
First measurement Length (cm)	30	165,00	10,32	0,085
Final measurement Length (cm)				
First measurement Weight(kg)	30	55,80	14,82	0,395
Final measurement Weight(kg)				

$p < 0,05$

According to Table 1, no significant difference was found in terms of the height and weight between before and after the exercise program ($p=0,085$; $p=0,395$).

Table 2. Pre and post-test balance scores of the men participating in the study comparison

Balance	N	X	SS	P
First measurement	30	19,20	9,41	0,001
Final measurement				

$p < 0,05$

According to the findings in Table 2, a significant difference was found in terms of balance scores between before and after exercise program ($p=0.001$).

Table 3. Comparison of pre and post-test Dual Coordination points of the men participating in the study

Dual Coordination	N	X	SS	P
First measurement	30	11,76	7,26	0,001
Final measurement		19,84	5,04	

p<0,05

According to Table 3, a significant difference was found in terms of dual coordination scores between before and after the exercise program (p=0.001).

Table 4. Comparison of pre and post-test upper extremity coordination scores of the men participating in the study

Upper extremity coordination	N	X	SS	P
First measurement	30	23,51	7,14	0,001
Final measurement		31,01	6,13	

p<0,05

According to the findings in Table 4, a significant difference was found in terms of upper extremity coordination scores between before and after exercise program (p=0,001).

Table 5. Comparison of pre and post-test fine motor accuracy scores of the men participating in the study

Fine motor accuracy	N	X	SS	P
First measurement	30	49,53	10,95	0,001
Final measurement		80,66	6,83	

p<0,05

According to Table 5, a significant difference was found in terms of the fine motor accuracy scores between before after the exercise program (p=0.001).

Table 6. Comparison of pre and post-test fine motor integration scores of the men participating in the study

Fine motor integration	N	X	SS	P
First measurement	30	47,69	8,98	0,001
Final measurement		77,33	7,03	

p<0,05

According to the findings in Table 6, a significant difference was found in terms of the fine motor integration scores between before and after the exercise program (p=0.001).

4. DISCUSSION

This study investigated the effect of exercise on motor skills in inclusive students. As a result, it was found that there were significant differences in balance, dual coordination, upper extremity coordination, fine motor accuracy and fine motor integration parameters of the 16 week exercise program in inclusive students.

When the averages of the weight and height of inclusive students in the study were examined, no significant difference was found before and after the training program. Özer et al., (1999), in their study comparing the physical characteristics of mentally retarded children with their normal developing peers, suggested that physical growth and development that had significant effects on motor performance, educational achievement and social behavior should be monitored for long-term development and that period-weight and skinfold thickness measurements suggest that students will be the source of preparation of individual physical education programs in terms of developing body form (Özer et al., 1999).

A lot of studies show that intellectual disabilities children can improve their motor skills, physical and motor fitness components through regular exercise programs. Physical and motor fitness of children with intellectual disabilities is

important to perform daily living activities which include walking, running, jumping, hopping, jumping, catching, throwing require physical and motor fitness (Özer & Kaplan, 2000). These skills are often considered as building blocks for the development of more complex motor and sport-specific skills and contribute positively to the activities of daily living (Özer & Kaplan, 2000; Watkinson et al., 2001; Stodden et al., 2008; Wall, 2004). Intellectual disabilities people are more likely to be physically inactive than people in the general population (Hall & Thomas, 2008).

In people with intellectual disabilities, balance performances and strength measurements can be significantly improved through various activities (Carmeli et al., 2005; Wang & Ju, 2002; Fotiadou, et al., 2009; Tsimaras & Fotiadou, 2004). Dynamic balance and coordination ability are important for motor skill performance at the developmental stage. Therefore, it is necessary to determine whether the balance and coordination capacities of people with intellectual disabilities can be improved by complex training program.

Rad et al. (2012) in their study; 20 children with autism were randomly selected for 8 weeks 3 times a week and 45 minutes a day. It is stated that the spark program was applied and the other 10 people were the

control group. BOT-2 test was used for all children before and after the study. It is emphasized that static balance parameters were higher in the exercise group than the control group (Rad et al., 2012).

Arslan & İnce (2015), in their study to determine the effect of children with atypical autism on rough motor skill levels, the motor skill BOT-2 tests of the autism exercise group. They found statistically significant difference in terms of balance I and II scores between pre and post test. It is stated that balance I and balance II posttest results are higher than balance I and balance II pretest results (Arslan & İnce, 2015).

Bayazıt et al. (2014), in a 6-week study aimed to examine the effect of basic gymnastic exercise on balance

REFERENCES

Arslan E. & İnce G. (2015). 12 haftalık egzersiz programının atipik otizmlı çocukların kaba motor beceri düzeylerine etkisi. Uluslararası Spor, Egzersiz ve Antrenman Bilim Dergisi, Cilt 1, Sayı 1, 51-62.

Attwood, T. (1998). Asperger's sendrome: a guide for parents and professionals. London and philadelphia: Jessica kingsley publishers Ltd, 223.

Bayazıt, B., Fil, H., Son, M., Çolak, S., Eskiyecek, C. G. & Çolak, E. (2014). Eğitilebilir zihinsel engelli kız çocuklarda cimnastik çalışma programının denge gelişimine etkisinin incelenmesi, Akademik

development in mentally retarded girls. Statistically significant differences were observed in terms of the balance scores between pre and post test (Marchewka, 2002; Dehghani & Günay, 2015; Bayazıt et al., 2014).

Some researchers have stated that physical exercises have a positive effect on the balance levels of mildly disabled people (Wang, 2002; Franciosi et al., 2010).

5. CONCLUSION

As a result of the study, The 16-week exercise program provided significant differences in terms of balance, dual coordination, upper extremity coordination, fine motor accuracy and fine motor integration parameters in inclusive students.

Sosyal Araştırmalar Dergisi, Yıl: 2, Sayı: 8, 370-377.

Berninger, V.W. & Rutberg, J. (1992). Relationship of finger function to beginning writing: application to diagnosis of writing disabilities. *Developmental Medicine & Child Neurology*, 34(3): 198-215.

Beversdorf, D.O., Anderson, M., Manning, S.E., Anderson, S.L., Nordgren, R.E., Felopulus, G.J. & Bauman, M.L. (2001). Macrographia in high-functioning adults with autism spectrum disorder, *Journal of Autism and developmental disorders*, 31(1):97-101

Bruininks, R. H. (1978). : Bruininks-Oseretsky Test of Motor Proficiency American

- Guidance Service, Minnesota, USA, pp.153.
- Carmeli, E., Zinger-Vaknin, T., Morad, M. & Merrick, J. (2005). Can physical training have an effect on well-being in adults with mild intellectual disability? Mechanisms of ageing and development, 126(2), 299–304.
- Çakıroğlu & Sökmen (2012), 12 Haftalık Judo Teknik Antrenman ve Oyunlarının 8–10 Yaş Grubu Erkek Çocuklarda Reaksiyon Zamanı Üzerine Etkisi, Selçuk Üniversitesi Beden Eğitimi ve Spor Bilim Dergisi, 2012; 14 (1): 71-74
- Dehghani M. & Günay M. (2015). The effect of balance training on static and dynamic balance in children with intellectual disability. Journal of Applied Environmental and Biological Sciences, 5(9)127-131.
- Demirci, H. (2009), Esneklik Çalışmalarının Eğitilebilir Zihinsel Engelli Çocukların Hareketlilik Gelişimleri Üzerine Olan Etkisi, Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, Sakarya Üniversitesi, Sakarya
- Deitz, J. C., Kartin, D. & Koop, K. (2007). Review of the Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT-2), Physical & Occupational Therapy in Pediatric, 27, 4, 87-104.
- Eichstaedt, C. B. & Lavay, B.W. (1992). Physical aktivite for individuals with mental retardation, Illinois: Human Kinetics Books, 463.
- Fotiadou, E. G., Neofotistou, K. H., Sidiropoulou, M. P., Tsimaras, V. K., Mandroukas, A. K. & Angelopoulou, N. A. (2009). The effect of a rhythmic gymnastics program on the dynamic balance ability of individuals with intellectual disability. Journal of Strength and Conditioning Research, 23, 2102–2106.
- Franciosi, E., Baldari, C., Gallotta, M. C., Emerenciani, G. P. & Guidetti, L. (2010). Selected factors correlated to athletic performance in adults with mental retardation. Journal of Strength and Conditioning Research, 24(4), 1059–1064.
- Hall, J. M. & Thomas, M. J. (2008). Promoting physical activity and exercise in older adults with developmental disabilities. Topics in Geriatric Rehabilitation, 24, 64–73.
- Marchewka, A. (2002). The influence of the improving physical exercises for the body balance of mentally handicapped persons, in the moderate degree of retardation. Medycyna Sportowa, 18, 111–115.
- Özer D. S., Aral N., Özer K. & Güvenç A. (1999). Eğitilebilir zihinsel engelli çocukların fiziksel özelliklerinin normal gelişim gösteren yaşlıları ile karşılaştırılarak incelenmesi, BESBD 3:4.
- Özer D. S. & Kaplan Ö. (2000). Eğitilebilir zihinsel engelli erkek çocukların görsel ve işitsel reaksiyon sürelerinin normal gelişim gösteren akranları ile karşılaştırılarak incelenmesi. Gazi Beden Eğitimi ve Spor Bilimleri Dergisi, 31-38.
- Özgür, İ. (2011). Engelli Çocuklar ve Eğitimi Özel Eğitim, "3. Baskı", Adana: Karahan Kitap evi, 197-213.

- Piek, J. P. & Dyck, M. J. (2004). Sensory motor deficits in children with developmental coordination disorder, attention deficit hyperactivity disorder and autistic disorder. *Human Mov Sci.* 23:475-488.
- Rad, L.S., Rafiee, F. & Fahimi, S. (2012). The effect of selected physical exercises on gross motor skills of autistic children. *International Journal of Sport Studies*, 2(1), 44-55.
- Ryoichiro, I., Chisato, K. & Reiko, T. (2000). Brief report: comparison of sensory-motor and cognitive function between autism and asperger syndrome in preschool children, *Journal of Autism and Developmental Disorders*, 30(2):169-175.
- Stodden, D. F., Goodway, J. D., Langendorfer, S. J., Roberton, M. A., Rudisill, M. E., Garcia, C., et al. (2008). A developmental perspective on the role of motor skill competence in physical activity: An Emergent Relationship. *Quest*, 60, 290–305.
- Tekin, S.Y. (2016), *Atletizm, Güreş, Taekwondo Branşı Yapan Sporcuların Denge Performanslarının İncelenmesi*, Sağlık Bilimleri Enstitüsü, Yüksek Lisans Tezi, Selçuk Üniversitesi, Konya
- Thompson W, Gordon N. & Pescatello LS, 2009. *ACSM's Guidelines for Exercise Testing and Prescription*. 8th ed. Baltimore, MD: Lippincott Williams and Wilkins; p. 253-5.
- Topsaç M. (2013), *Üniversite Okuyan Engelli Öğrencilerin Fiziksel Aktivite Düzeylerinin İncelenmesi*, Sağlık Bilimleri Enstitüsü, Yüksek Lisans tezi, Dumlupınar Üniversitesi, Kütahya.
- Tsimaras, V. K. & Fotiadou, E. G. (2004). Effect of training on the muscle strength and dynamic balance ability of adults with down syndrome. *Journal of Strength and Conditioning Research*, 18(2), 343–347.
- Wall, A. E. T. (2004). The developmental skill-learning gap hypothesis: Implications for children with movement difficulties. *Adapted Physical Activity Quarterly*, 21,197-218.
- Wang, W. Y., & Ju, Y. H. (2002). Promoting balance and jumping skills in children with down syndrome. *Perceptual and Motor Skills*, 94(2), 443–448.
- Watkinson, E. J., Causgrove, Dunn, J., Cavaliere, N., Calzonetti, K., Wilhelm, L. & Dwyer, S. (2001). Engagement in playground activities as a criterion for diagnosing developmental coordination disorder. *Adapted Physical Activity Quarterly*, 18, 18– 34.