Foreign Studies
Чуждестранни изследвания

THE ANALYSIS OF THE EFFECTS OF GAME AND MOVEMENT EDUCATION ACTIVITIES ON MOTOR SKILLS OF MENTALLY RETARDED INDIVIDUALS

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Abstract. This study aims to analyse the effect of game and movement educations on motor skills of mentally retarded individuals.

The sample of the study is composed by 32 students of Faika Erkut Special Education Primary School, Faika Erkut Special Education Elementary School and Faika Erkurt Special Education Vocational Education Center. ($n_{experimentgroup}$ =16, $n_{controlgroup}$ =16). The IQ level of the sample group ranges between 45 – 75 and their ages range between 17 and 18.

In the research, Illionis agility test, stork balance test (eyes open) and sit-access flexibility test are used as assessment instruments. The students' flexibility, balancing and agility features are assessed twice with Illionis agility test, stork balance test (eyes open) and sit-access flexibility test; one is at the beginning of the study and one after 8-week game and movement education program.

The findings of the research have been analysed using Wilcoxon test or Mann Whitney U test. At the end of the research, when pre-test and post-test averages of mentally retarded individuals in experiment and control groups were compared, it was found out that although experimental group showed a statistically significant development ($p<0.05$) in flexibility, balance and agility features, the individuals who did not take part in game and movement education program showed a statistically significant difference in agility feature ($p<0.05$).

Keywords: mentally retarded, educational game, flexibility, agility, balance

1. Introduction

Besides game is an activity that exists in every stage of life, it is defined as the most appropriate way for a child to learn the world where he/she lives in and to express feeling like happiness, anxiety and joy especially in the first years of his/her life. Thanks to games, children learn to discover, imitate the models they see in life and develop the skills they already have. It is known that psychomotor development which has a great importance in all developmental areas is affected by game and thanks to game, it shows development. Game is a learning environment where children learn by doing and experiencing. Game

is not only important for children's social, language and cognitive development but also motor developments. With psychomotor activities, a child develops speed and distance perceptions and the skills of dealing with obstacles, solving problems, coordinating with others, planning and building (Pişkin, 1993; Sevinç, 2004).

As it is for normal children, game is one of the most effective physical activity for mentally retarded children. Many different definitions have been given about being mentally retarded as a result of studies having been conducted in psychology for long years. The last definition about this topic has been provided by American Association of Mental Retardation (Conyers *et. al* 1992). According to this definition, mental retardation is both the inadequacies in adaptive behaviours and general intelligence functions' being significantly below the average during development process. As stated in this definition, mentally retarded individuals have retardation in motor development as in all development areas. Thanks to game, the transition of mentally retarded individuals to the following physical activities can be provided by reinforcing their motor skills (Ün&Çoknaz 2003).

In his study conducted on between 9 – 16 age, 169 girls and 265 boys by analysing height, weight and motor competency measurements with the aim of identifying the dynamics and profiles of somatic and motoric developments of mentally retarded students, Zosgornik (1989) has found out that mentally retarded children are far behind their peers in terms of motor skills and somatic development. Also, in this research, it has been emphasized that mentally retarded girl and boy children have a tendency to be shorter and small sized, and they transfer to puberty 1 – 2 years later than their normal peers and usually they fall behind in terms of motor skills development.

Motor development retardation in mentally retarded children are usually observed as coordination and balance problems. Bruninks v& Chavat (1990) state that the most common loss on mentally retarded individuals is seen in coordination, balance, speed, strength and manipulative skills. In his other study, Bruninks (1994) reveals that mentally retarded children fall behind normally developed children in fine and gross motor skills development and this loss is increasing with the increase in mental retardation and their getting older, also compared to their peers who show normal development the biggest difference is observed as standing long jump and body coordination.

Some researchers think that the loss in motor development of mentally retarded children results from inadequate physical activities. Clark&Clark (1978) claim that the loss of physical fitness and motor development of mentally retarded children result from inadequate education and not giving enough participation chance in the games. It is stated that children who do not participate in the activities or who are not allowed to participate in the games by their friends retard in terms of physical or motor fitness elements and lose their skills to a great extent.

Similarly, Siedentop (1986) states that if mentally retarded children are not allowed to participate in the games, they cannot develop their physical and motor fitness levels and motor skills. It is known that mentally retarded children are more deficient than normally developed children in terms of physical and motor fitness elements such as strength, endurance, agility, balance, running, flexibility and speed (Özer, 2010). In their study, Hinckson&Curtis (2013) compared the physical activity level of mentally retarded teenager and children with normally developed peers' and they found out that the physical activity level of mentally retarded individuals is less than normally developed ones. Barr&Shields (2011) emphasizes that including down's syndrome children in physical activity programs will have positive effects on their motor, social and behavioural skills. In this respect, the education given and games played in physical education lessons are the biggest supporters of physical and psychomotor development. Therefore, game and movement education should not be looked only as an activity done by children at home or in the streets. Especially at schools, it is important to have games and movement education programs along with physical education programs. With the help of game activities in a well planned and organized free time program, the skills needed for an easy adaptation to the environment and for the development of physical, social, emotional and self-confidence can be developed in educable mentally retarded ones (Bayazıt *et al*., 2007; Kuru, 2009).

Accordingly, in this research, it has been aimed to analyse the effects of game and movement education activities on mentally retarded individuals.

2. Material and Method

This research is one that has been shaped by experimental research method. The sample of the research includes 32 (16 experimental group and 16 control group) mentally retarded students studying at Faika Special Education schools in Edirne. The IQ levels of these students range between 45-75 and their ages range between 17 and 18. In this study, simple random sampling has been used to match the students in experimental and control group. While deciding on the sample group of the study, the ones who have done sports before and seriously mentally retarded ones are excluded from the research.

Assessment Instruments Used in the Research

In the research, General Knowledge Form including 17 questions prepared by researchers has been used to identify the demographic information about the disabled individuals. Body Flexion Test, Stork Balance Test, Illionis Agility Test have been used to identify the flexibility, balance and agility features of the disabled individuals.

Body Flexion Test: Body flexion has been identified with Standing Trunk Flexion Meter (Takei Physical Fitness Test, TKK 5103, Made in PRC). The participant has repeated the test twice in 30 seconds intervals without shoes. The better assessment has been recorded as the participant's body flexion value (Mackenzie, 2005).

Stork Balance Test: It has been applied on dominant leg as eyes open. Before the test, each participant had 2 chances to try. In the cases when the leg in the air touches the ground or hands drop the waist, the test has been finalized and test score has been recorded as seconds (Mackenzie, 2005).

İllionis Agility Test: Each participant completed the test accompanied by a guide. It repeated once and performance duration has been recorded as seconds (Mackenzie, 2005).

Application Process

At the beginning of the study, pre-test data have been collected using vertical body flexion test, stork balance test and Illionis agility test to identify the flexibility, balance and agility features of the students in experimental and control groups assigned by simple random sampling method. Afterwards, for 8 weeks, students in the experimental group continued to take the movement and game program during 1 physical education lesson hour 3 days a week and they continued to take the physical education lesson program at school 1 day a week. This program has been carried out in physical education hall at the special education school by two physical education teacher. The program included the games which support the children's balance, agility, speed and interaction skills (such as slalom games and hopscotch). While the students in the experimental group were attending 8-week program, the students in the control group attended only the physical education lessons at their schools. They did not attend the movement and game program carried out as a part of the research. At the end of the 8- week, the students in both groups have been evaluated with respectively vertical body test, stork balance test and Illionis agility test in terms of flexibility, balance and agility features and post-test data have been collected.

The analysis of the data

In this research, the data gathered from general knowledge form and the other assessment instruments has been analysed on SPSS 17.0 program on computer and the significance level has been tested on .05. The conformity of the data to normal distribution has been examined with Kolmogrov-Smirnov test. For the comparison of the normally distributed variables among the groups, t-test which has been matched according to group structure or t test in independent groups has been used, and defining statistics have been shown as average±standard deviation. For the comparison of the variables which are not normally distributed either Wilcoxon test or Mann Whitney U test has been used according to group structure and defining statistics have been shown as median (25 – 75 percentile).

3. Results

Table 1. Specifications of disabled Individuals in experimental and control groups who participated in the research

	Group		
Variable	Experimental(n=16)	Control(n=16)	P
Age	17 (17-18)	17 (18-18)	0,423
Height	164,5 (159,5-168,375)	157 (149,75-160,75)	0,007*
Weight	67,5 (55-74,125)	60 (54,25-66,75)	0,196

* $p< 0,05$

In Table 1, specifications (age, height, weight) of the disabled individuals in experimental and control group who participated in the research are shown. As seen in Table 1, the age range has been found similar in both groups when the age averages of the individuals in the control group have been compared with the age averages of the individuals in the control group. When the height averages of the individuals in experimental and control group have been analysed, it has been identified that the height averages of the students in the experimental group are higher than the ones in control group. This difference has been found statistically significant ($p< 0,05$). When the weight averages of the individuals in experimental and control groups have been analysed, the weight averages of the students in the experimental group have been found higher than the ones in control group, but this difference has not been found statistically significant ($p< 0,05$).

Table 2. The comparison of the pre-test scores of flexibility, balance and agility features of the students in experimental and control groups

	Group		
Variable	**Experimental(n=16) x±ss**	**Control(n=16) x±ss**	P
Flexibility	-4,644±6,538	-5,35±5,956	0,752
Balance	3,425 (2,27-5,275)	2,86(2,195-6,683)	0,564
Agility	23,548±2,684	25,473±4,448	0,149

* $p< 0,05$

In Table 2, the score averages that mentally retarded individuals in experimental and control group got from flexibility, agility and balance tests have been shown. Although flexibility score averages of the individuals in the experimental group **(**-4,644±6,538)

have been found lower than the score averages of the mentally retarded individuals in the control group(-5,35±5,956) at the beginning, the difference has not been found significant (p> 0.05).When the scores of the students that they got from the balance test have been analysed, the score averages of the students in the control group have been found higher than the ones in the experimental group. It has been identified that this difference between two groups is not significant (p> 0.05). The agility score averages of the individuals in the experimental group (23,548±2,684) have been found higher than the agility score averages of the individuals in the control group at the beginning (25,473±4,448). This difference is not statistically significant (p> 0.05).

Table 3. The comparison of the pre-test and post-test scores that the students in the experimental and control groups get from flexibility, balance and agility tests

		Before	**After**	**P**
Game group	Flexibility(n=16)	-4,644±6,538	-2,144±7,486	0,013*
	Balance(n=16)	3,425 (2,27-5,275)	5,3(3,525-7,688)	0,015*
	Agility(n=16)	23,548±2,684	22,344±3,056	0,005*
Control	Flexibility(n=16)	-5,35±5,956	-2,85±7,449	0,059
	Balance(n=16)	2,86(2,195-6,683)	3,235(2,493-5,548)	0,605
	Agility(n=16)	25,473±4,448	23,951±3,246	0,038*

* p< 0,05

In Table 3, the pre-test and post-test score averages that the mentally retarded individuals in the experimental and control groups get from flexibility, balance and agility test have been shown. When the flexibility, balance and agility pre-test score averages of the individuals in the experimental group are compared with post-test score averages, it is seen that post-test scores are higher that pre-test scores. This difference has been found statistically significant (p< 0,05). As seen in Table 3, when the flexibility and balance pre-test and post-test scores of the individuals in the control group are analysed, it is seen that the difference is not statistically significant (p> 0,05). The difference has been found significant (p< 0,05) only between the scores that the individuals in the control group got from agility pre-test and post-test.

4. Discussion

Although mentally retarded children go through the same development stages as normally developed children, they fall behind them and they cannot develop as they do (Zosgornik 1989; Bruninks&Chavat 1990; Bruninks 1994; Özer 2010). In addition, when physical activity levels of the normally developed children are compared with mentally retarded individuals' activity levels, it is emphasized that mentally retarded

individuals levels' are lower and they need more physical activity opportunities (Barr& Shields 2011, Howie *et al*. 2012). Accordingly, in this research, the effects of game and movement program on flexibility, balance and agility skills of mentally retarded children have been analysed. As known, game and exercise programs have a positive effect on development of children regardless of their mental capacities (Clark&Clark 1978; Siedentop 1986; Ün&Çoknaz 2003; Stodden *et al*. 2008). In this research, as seen in Table-2, the balance, agility and flexibility scores of mentally retarded individuals are similar in both control and experimental group at the beginning. However, after game and movement program, a statistically significant difference has been found between the flexibility, agility and balance pre-test scores and post-test scores of the students in the experimental group. When the score averages of the students in the control group have been analysed, a significant change has not been observed in flexibility and balance scores, but a statistically significant difference has been observed in agility scores.

As seen in these findings, game and movement education programs for mentally retarded individuals are supportive for their motor skills. The significant difference in agility scores of the individuals in the control group can be seen as a result of routine physical education programs in their schools. Physical activities for mentally retarded children and adolescents have positive effects on both their physical development and social developments. Especially, in adolescence, as a result of moving less, mentally retarded individuals suffer from obesity, and this affects their movement capabilities in a negative way. It is important to include lifelong physical activities in mentally retarded individuals' daily programs to eliminate these risks. It is also emphasized by some researchers that mentally retarded children's being involved in physical activity programs has positive effects on their motor skill (Stodden *et al.* 2008; Hayakawa&Kabayashi 2011; Gonzalez *et al* 2011, Loyd *et al.* 2012).

Similar to this research, Biçer *et al.* (2004) have observed in their study in which they analysed the effects of power and strength exercises on movement skills of mentally retarded children that these exercises have an effect on students' vertical jumping skills. In his study, Rimmer et al (2004) included 52 mentally retarded adults in an exercise program for 12 weeks and recorded significant developments in individuals' motor performances. In parallel with the findings of this research, Ün *et al.* (2004) have identified a significant difference in cardiovascular endurance, speed, agility, elbow and knee flexion- extension, muscle strength and hand static muscle strength balance of the individuals in the control group after 12-week program in their research in which they analysed the effect of physical fitness education program on physical fitness levels of mentally retarded children. In their study, Gupta & Rao(2011) have applied a program to down syndrome children to support their strength and balance skills, and they have found out that a special exercise program develops strength and balance skills of down syndrome children.

Similar to this study, Barwick *et al.*(2012) have analysed the effects of functional education on physical capacities and functional skills of mentally

retarded adolescents and found out that functional education has a positive effect on their motor skills. As seen in the findings of the research, a statistically significant difference ($p<0.05$) has been identified in flexibility, balance and agility skills of the individuals in the experimental group after 8-week movement and game education of the mentally retarded individuals in the experimental and control group. When the score of the control group has been analysed, a statistically significant development ($p<0.05$) has been observed only in their agility skills. As seen in these findings, game and movement education programs have positive effects on motor skills of mentally retarded individuals. Especially after adolescence, including game and movement education in mentally retarded individuals' education programs will be supportive for their all developments areas. It can be suggested to the experts who will do research on this topic that they focus on the relationship between disabled individuals' free time activities and habits, and motor activity.

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