EXAMINATION OF PHYSICAL FITNESS PARAMETERS OF TRAINABLE INDIVIDUALS WITH INTELLECTUAL DISABILITY

EXAME DE PARÂMETROS DE APTIDÃO FÍSICA DE INDIVÍDUOS COM DEFICIÊNCIA INTELECTUAL TREINÁVEIS

EXAMEN DE PARÁMETROS DE CONDICIÓN FÍSICA DE PERSONAS CON DISCAPACIDAD INTELECTUAL ENTRENABLES

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ABSTRACT: This study was conducted to compare the physical fitness values of children with intellectual disability aged 13-18 according to some parameters within the scope of the physical activities project. The study group consists of 12 trainable intellectual disabled individuals. In the study, pre-test and post-test values were taken for the physical fitness test scores of the trainable disabled individuals. The first weight averages of the subjects participating in the study were 69.58 ± 8.8, the last measurement results were 70.08 ± 10.1, the Biceps measurement averages were 7.42 ± 2.9 in the first measurement, the average of the post-test measurement results were 10.58 ± 6.4, the Triceps averages of the first measurement results were 12.75 ± 5.4. As a result of the study, it can be said that the participation of trainable intellectual disabled young people in sports activities has a positive effect on their physical fitness.

KEYWORDS: Intellectual disability. Physical fitness. Training.

RESUMO: *Este estudo foi realizado para comparar os valores de aptidão física de crianças com retardo mental de 13 a 18 anos de acordo com alguns parâmetros dentro do escopo do projeto de atividades físicas. O grupo de estudo é composto por 12 indivíduos com deficiência mental treináveis. No estudo, os valores pré-teste e pós-teste foram tomados para os escores do teste de aptidão física dos indivíduos com deficiência treináveis. As primeiras médias de peso dos sujeitos participantes do estudo foram 69,58 ± 8,8, os resultados da última medição foram 70,08 ± 10,1, as médias de medição do bíceps foram 7,42 ± 2,9 na primeira medição, a média dos resultados da medição pós-teste foi de 10,58 ± 6.4, as médias do tríceps dos primeiros resultados da medição foram 12,75 ± 5,4. Como resultado do estudo, pode-se afirmar que a participação de jovens com deficiência mental treinável em atividades esportivas tem um efeito positivo em sua aptidão física.*

PALAVRAS-CHAVE: *Deficiência intelectual. Aptidão física. Treinamento.*

RESUMEN: *Este estudio se llevó a cabo para comparar los valores de condición física de niños con discapacidad intelectual de 13 a 18 años según algunos parámetros dentro del alcance del proyecto de actividades físicas. El grupo de estudio consta de 12 personas con*

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discapacidad intelectual entrañables. En el estudio, se tomaron valores previos y posteriores a la prueba para las puntuaciones de las pruebas de aptitud física de las personas discapacitadas entrañables. Los primeros promedios de peso de los sujetos que participaron en el estudio fueron 69,58 ± 8,8, los resultados de la última medición fueron 70,08 ± 10,1, los promedios de medición de Bíceps fueron 7,42 ± 2,9 en la primera medición, el promedio de los resultados de la medición posterior a la prueba fue de 10,58 ± 6.4, los promedios de tríceps de los primeros resultados de medición fueron 12.75 ± 5.4. Como resultado del estudio, se puede decir que la participación de jóvenes con discapacidad intelectual entrañable en actividades deportivas tiene un efecto positivo en su condición física.

PALABRAS CLAVE: *Discapacidad intelectual. Aptitud física. Entrenamiento.*

Introduction

Intellectual disability is a multifaceted and complex condition characterized by significant deficits in both mental functions and adaptive behaviors, including conceptual, social, and practical skills (BOUZAS *et al.*, 2018). Individuals with intellectual disability have deficiencies in motor (movement) development, as in all other developmental areas (social, emotional, psychological). Inadequacies in the field of motor development may arise from the negativities of other developmental fields, as well as from inadequacy in the field of physical fitness. Individuals with intellectual disabilities, like other individuals, need to have sufficient physical fitness levels to be able to perform their daily activities. It has been reported that motor problems are common in individuals with intellectual disabilities since intellectual disability is a condition that affects cognitive and motor functions (CLEAVER *et al.*, 2009; HARTMAN *et al.*, 2010). In addition to impairments in cognitive and motor functions, individuals with intellectual disabilities have lower levels of physical fitness at all stages of life due to an inactive (sedentary) lifestyle, fewer opportunities for physical exercise, and self-efficacy (FREY *et al.*, 2008; LOTAN *et al.*, 2004; SKOWRONSKI *et al.*, 2009). Physical fitness has been accepted as the characteristics that enable people to perform physical activity with health-related components such as cardiorespiratory endurance, muscle strength, muscular endurance, flexibility, and body composition (TVETER *et al.*, 2014). It is not correct to attribute the low level of physical fitness of individuals with intellectual disability (children) to limited cognitive abilities only. The lack of appropriate physical education programs, appropriate teaching techniques, and practices for these children can be counted among other important reasons (ERTÜRK, 2010). Physical fitness is seen as an important area to focus on because very low levels of physical fitness found in people with intellectual disabilities (GOLUBOVIC *et al.*, 2012; HILGENKAMP *et al.*, 2012; OPPEWAL

et al., 2013; SALAUN; BERTHOUZE-ARANDA, 2012). In his study, Karakaş (2018) observed that 24-week leisure activities improved the physical fitness of individuals with mild intellectual disabilities. One of the main goals to be considered while providing support to individuals with intellectual disabilities is to promote healthy aging (PRYCE *et al.*, 2017). Studies have shown that it is possible to develop physical fitness, activity, and motor skills in children and adolescents with intellectual disability (GOLUBOVIC *et al.*, 2012; HOCKING *et al.*, 2016; SHIN AND PARK, 2012).

Additional research appears to be needed to develop and test interventions that encourage individuals with intellectual disabilities to be willing participants in the activity to initiate and maintain physical activity (RIMMER; BRADDOCK, 2002). The hardest part for children with intellectual disabilities is finding an appropriate exercise program to maintain their interest in participating and to maintain participation over a long period of time. As with individuals without a disability, exercise is very important in terms of physical fitness and ensuring continuity in children with disabilities. In this context, this study aims to examine the physical fitness parameters of the individuals with intellectual disability aged 13-18 in Çanakkale province between the period when they do sports and the period after they quit sports.

Methodology

Research Design

In the research, the experimental design without a pre-test/ post-test control group was used to determine the physical fitness parameter status of the individuals with disability.

Research Group

The target population of the study consists of 310 trainable people with intellectual disability living in Çanakkale in 2015-2016. The sample of the study consists of individuals aged 13-20, with Mild Mental Retardation (60-70 IQ), who did not have body function deficiencies determined from the reports of individuals, and whose family consent was obtained voluntarily. The research group includes the entire universe of the study. It consists of 15 trainable people with intellectual disability residing in Çanakkale city center.

Instruments

Skinfold Measurements

Skin Fold Thickness Measurements are taken from the triceps, subscapular, or calf regions.

–Triceps skinfold measurement is taken over the triceps muscle between the shoulder tip and the elbow.

– The subscapular skinfold measurement is taken 2.5 cm below the scapula towards the midline of the body.

– Calf skinfold measurement is taken from the maximum level of the calf, with the foot placed on a raised surface with the knee flexed at 90º. Measurements should be taken from the dominant side, the skinfold caliper used for skinfold measurements should maintain a constant pressure of 10 g/mm². Three measurements are taken for each region, the average score is accepted as the criterion (WINNICK; SHORT, 2002).

(Flexibility) Sit- Reach test

In this test, the arm should be stretched, and it is slid from one area to the other on the sit-and-reach table. The test is designed to measure flexibility in the hamstring muscle. In participants, very thin items worn on the feet are allowed, the participant sits on the bottom of the test material. Both legs are kept in full extension, feet straight opposite at the end of the box, participant tries to reach the highest degree on the measuring ruler with arms outstretched palm facing down, performs the movement with both hands lying on the ruler in 4 times. At the 4th lying, the participant waits at least 1 second, it is important that the participant moves the body while the knee is bent. For this test, the measurement is best taken with a 30x30 flexibility test material, the measuring instrument is placed with the starting point “0” on the participant's side, and the participants place their feet on the starting side. The measurement intervals on the measuring box should be between 0 and 40 cm. The participant is given 1 attempt, the tester records the last reach (attempt) in cm. (WINNICK; SHORT, 2002)

Data Collection

To reach the source information about the research, an archive scan was made about the relevant field. Skinfold Measurements and Sit-reach flexibility measurements of the trainable intellectually disabled were taken because of the 'No Barriers in Sports' project in 2015, and the same measurements were taken again from 15 participants who stopped doing sports after this project, 6 months later. In this way, conclusions about the research were reached.

Analysis of the Data

A pretest-posttest patterned research model was used in the study. Measurements were taken as a result of the physical activity project of the participants and the data obtained from these measurements formed the pre-test values. For the post-test values, the participants were reached after 6 months and it was determined that 15 of them did not do sports after the project had been completed, and the same measurements were made, and the data were obtained. The pre-test and post-test values obtained were firstly analyzed with the Shapiro-Wilk-W test to test the normality of the distributions.

Results

Table 1 - Pre-test, post-test mean values of the participants

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	kilo_öntest	69.58	12	8.878	2.563
	kilo_sontest	70.08	12	10.122	1.922
Pair 2	biceps_öntest	7.42	12	2.968	.857
	biceps_sontest	10.58	12	6.417	1.852
Pair 3	triceps_öntest	12.75	12	5.479	1.582
	triceps_sontest	16.25	12	8.635	2.493
Pair 4	subscapula_öntest	16.42	12	6.007	1.734
	subscapula_sontest	21.17	12	10.727	3.097
Pair 5	suprailiak_öntest	15.75	12	6.398	1.847
	suprailiak_sontest	23.08	12	12.522	3.615
Pair 6	otureriş_öntest	17.83	12	10.616	3.065
	otureriş_sontest	15.17	12	10.590	3.057

Source: Devised by the author

The weight averages of the subjects participating in the study were 69.58 ± 8.8 in the first measurement, 70.08 ± 10.1 in the post measurement, Biceps averages were 7.42 ± 2.9 in the first measurement, 10.58 ± 6.4 in the post-test measurement results, Triceps averages were 12.75 ± 5.4 in the first measurement results, and in the final measurement results were found to be 16.25 ± 8.6; when we look at the sub scapula measurement results, the first measurement averages are 16.42 ± 6, the last measurement average is 21.17 ± 10.7, the Supra-iliac measurement average is 15.75 ± 6.3, the last test average is 23.08 ± 12.5, and finally the first Sit- reach measurement average is 17.83 ± 10.6, the last test is 15.17 ± 10.5.

Table 2 - Shapiro-Wilk-W test results of participants' pre-test post-test mean values

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	%95 Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	kilo_öntest-kilo sontest	-.500	7.129	2.058	-5.029	4.029	-.243	11	.813
Pair 2	biceps_öntest biceps_sontest	-3.167	4.783	1.381	-6.206	-.128	-2.293	11	.043
Pair 3	triceps_öntest triceps_sontest	-3.500	4.543	1.311	-6.386	-614	-2.669	11	.022
Pair 4	subscapula_öntest subscapula_sontest	-4.750	7.338	2.118	-9.412	-.088	-2.242	11	.046
Pair 5	suprailiak_öntest suprailiak_sontest	-7.333	6.933	2.001	-11.738	-2.929	-3.664	11	.004
Pair 6	otureriş_öntest otureriş_sontest	2.667	3.916	1.130	.179	5.155	2.359	11	.038

Source: Devised by the author

As a result of the statistics, a significant difference was found between the biceps, triceps, sub scapula, supra-iliac, and sit-reach measurements ($p<0.05$). There was no significant difference between the first weight measurement and the last weight measurement ($p>0.05$).

Discussion

Adaptation of individuals with intellectual disability to life in society will be possible by having the opportunities that normal individuals have and removing the obstacles in front of these individuals. Participating in sports activities will contribute to their physical fitness and this will increase their quality of life. The following results were obtained in this study, in which the physical fitness parameters of trainable individuals with intellectual disability between the ages of 13-18 were investigated between the period when they did sports and the period after they quit sports.

Considering the body weight (kg) variability, no significant difference was found in the pre-test and post-test comparisons. In the study conducted by Karakaş (2018) with individuals with mildly intellectual disability, it was observed that body mass index values in both groups' post-test values decreased compared to the pre-test values, but there was no significant difference between the groups. Rimmer (2004) found a significant decrease in body weights of 52 adult individuals with intellectual disability after 45-minute workout program 3 days a week for 12 weeks. Uçar (2020) found an increase in body weight parameters of individuals in his study examining the effect on physical fitness, manual dexterity, and reaction time in trainable individuals with intellectual disability during 8-week basketball training. In Konar's (2020) study, significant differences were also found in the bodyweight parameter. Although the activities within the scope of the project were carried out for a period of 6 months, the activities may not have influenced the body composition of the individuals. In the literature review, it can be concluded that body weights cannot change significantly in a short time. Collins and Stapler (2017) mentioned that participation in exercise throughout life should be more for individuals with intellectual disabilities to be healthy. As a result of the study, it is seen that the trainable people with intellectual disability must move with low or high intensity. Weight control should be the most important physical fitness criterion not only for people with intellectual disability but also for all disability groups. Like normal individuals with excess weight, disabled people are also adversely affected by excess weight in terms of quality of life, mobility, sociological and psychological (SAVUCU; BIÇER, 2009).

A significant difference was found when the participants' biceps subcutaneous fat measurement, sub scapula subcutaneous fat measurement, and supra-iliac subcutaneous fat measurement were compared in the pretest-posttest. Balic (2000) found significant differences in studies with people with Down syndrome. When the skinfold values obtained in the study

of Bağdatlı and Deliceoğlu (2014) with trainable individuals with intellectual disability were examined, it was determined that the girls had higher mean values than the boys. Although there was no significant difference in the body weights of the participants, there were significant differences when we looked at the subcutaneous fat levels. Based on these results, we can conclude that physical activities will contribute to having strong muscles and this will affect the subcutaneous fat level positively when sports are done, and negatively when sports is quitted.

A significant difference was found when the pre-test and post-test were compared according to the sit-and-reach variable of the participants. The mean of sit and reach measurements were found as 17.83 ± 10.6 in the first measurement and 15.17 ± 10.5 in the last test. As a result of this study, we can say that the high results in subcutaneous fat measurements do not have any negative effects on flexibility. In the study of Bağdatlı and Deliceoğlu (2014), when the sit--reach values were examined, it was obtained that the mean values of 23.52 cm in girls and 22.34 cm in boys in relation to the flexibility of the right leg, and 23.84 cm in girls and 21.98 cm in boys in terms of left leg flexibility. Dorsan *et al.* (2015) found that there were statistically significant differences between the experimental and control groups in terms of flexibility after 12 weeks of dance training in the study where they examined the effect of 12-week dance training on physical fitness values of children with intellectual disability. At the end of the basketball training program, which was applied to children with intellectual disability for 12 weeks, 2 days, and 1 hour a week, a positive increase was observed in the flexibility parameter of children (UÇAR, 2020). In the study of Karakaş (2018), it was observed that flexibility increased by 7.48% in the experimental group, while it decreased by 6.63% in the control group. However, no significant difference was found between the groups. Although the frequency of activities and the contents are effective in improving flexibility, it can be said that they are not important enough to make a difference. Short (2017) stated that the frequency of activities to improve flexibility should be at least three days per week.

Conclusion

As a result, it is observed that while the Skinfold measures increase, there is an improvement in sit-reach measures because trainable children with intellectual disability quit the sport. When the variability of body weights is examined, it is seen that it increases very

little. In this context, it is thought that the inactivity of children with intellectual disability negatively affects their physical fitness.

Suggestions

As a result of the research, the following suggestions are presented in terms of the physical fitness pre-test-post-test results of the trainable individuals with intellectual disability.

1. Reaching more trainable individuals with intellectual disability will increase the quality of the study.
2. Such studies can be carried out by using different physical fitness tests.
3. Reaching disabled people outside the city center is important regarding public liability, social responsibility, and conscientious responsibility. Providing such opportunities to disabled people outside the city center will be beneficial in terms of equal opportunities.
4. Giving seminars to families about such studies will increase the cognitive level of families and may cause them to contribute more positively to children with disabilities.
5. Studies carried out for scientific purposes should not be terminated with the end of scientific work but should be continued in a stable manner.
6. Public institutions, local governments, non-governmental organizations, educational institutions, all responsible individuals should strive to remove the obstacles in front of the disabled and provide support. The most important criterion for removing barriers is to ensure that all opportunities available to individuals who do not have health problems can be accessed by the disabled.

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How to reference this article

KARAKOÇ, B. Examination of physical fitness parameters of trainable individuals with intellectual disabilities. **Revista online de Política e Gestão Educacional**, Araraquara, v. 26, n. esp. 1, e022045, Mar. 2022. e-ISSN: 1519-9029. DOI: https://doi.org/10.22633/rpge.v26iesp.1.16774

Submitted: 08/11/2021
Required revisions: 28/12/2021
Approved: 21/02/2022
Published: 31/03/202