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# ZİHİNSEL YETERSİZLİĞİ OLAN ÇOCUKLARA UYGULANAN KAPSAYICI FİZİKSEL AKTİVİTELERİN FİZİKSEL AKTİVİTE DÜZEYİ VE SOSYAL BECERİLER ÜZERİNDEKİ ETKİSİ*

# THE EFFECT OF INCLUSIVE PHYSICAL ACTIVITIES APPLIED TO CHILDREN WITH INTELLECTUAL DISABILITIES ON THEIR PHYSICAL ACTIVITY LEVEL AND SOCIAL SKILLS

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# Zihinsel Yetersizliği Olan Çocuklara Uygulanan Kapsayıcı Fiziksel Aktivitelerin Fiziksel Aktivite Düzeyi ve Sosyal Beceriler Üzerindeki Etkisi


## ÖZ

Bu çalışmanın amacı, kapsayıcı fiziksel aktivitelerin zihinsel yetersizliği (ZY) olan çocukların fiziksel aktivite düzeyi ve sosyal becerileri üzerindeki etkilerini incelemektir. Ön test – son test deneysel modelde tasarlanan çalışmaya, 20 ZY olan çocuk, 20 tipik gelişim gösteren (TGG) çocuk ve 15 gönüllü üniversite öğrencisi katılmıştır. ZY olan ve olmayan çocuklar rastgele bir uygulama grubuna (ZY olan çocuklar n:10; TGG çocuklar n: 10) ve bir kontrol grubuna ayrılmıştır (ZY olan çocuklar n:10; TGG çocuklar n: 10). Çalışmada, gönüllü üniversite öğrencilerinin desteğinde uygulama grubunda yer alan ZY olan ve olmayan çocuklarla birlikte 8 hafta süresince, haftada 3 gün 40'ar dakika süreyle kapsayıcı fiziksel aktiviteler gerçekleştirilmiştir. Kapsayıcı fiziksel aktiviteler genel olarak; grupla etkileşime imkân sunabilecek eğitsel oyunlar, sportif parkurlar, fonksiyonel egzersizler, branşlara özgü aktiviteler, dans etkinlikleri ve hareket eğitimi aktivitelerinden oluşmuştur. 8 haftalık kapsayıcı fiziksel aktiviteler öncesi, gönüllü üniversite öğrencilerine farkındalık oluşturma, uygulama öncesi yapılması gerekenler ve uygulama sırasında yapılması gerekenler olmak üzere üç aşamadan oluşan gönüllülük eğitimleri verilmiştir. Çalışma verileri; Kişisel Bilgi Formu, Sosyal Becerileri Değerlendirme Ölçeği ve Serbest Zaman Egzersiz Anketi aracılığıyla toplanmıştır. Veriler, Tekrarlayan Ölçümler ANOVA testi kullanılarak analiz edilmiştir. Çalışma kapsamında elde edilen bulgular, ZY olan çocukların fiziksel aktivite düzeyi ve sosyal beceri düzeyi üzerinde grup * ölçüm ortak etkisinin anlamlı olduğunu açığa çıkarmıştır. Bonferroni düzeltmesine göre, uygulama grubundaki ZY olan çocukların ön test puanlarına göre son test puanları anlamlı düzeyde yüksek iken; kontrol grubundaki ZY olan çocukların ön test – son test puanları arasında herhangi bir anlamlı farklılık olmadığı saptanmıştır. Sonuç olarak, kapsayıcı fiziksel aktivitelerin çalışmaya katılan ZY olan çocukların fiziksel aktivite düzeyi ve sosyal beceri düzeyi üzerinde olumlu yönde etkisi olduğu izlenimi edinilmiştir. Bu sonuçların daha sonraki çalışmalarda desteklenmesinin, ZY olan çocukların fiziksel aktivite düzeyi ve sosyal beceri düzeyini arttırmak için kapsayıcı fiziksel aktiviteleri kullanabilecek öğretmenlere, antrenörlere, uzmanlara ve akademisyenlere rehberlik edebileceği düşünülmektedir.


**Anahtar Kelimeler:** Zihinsel yetersizlik, çocuk, kapsayıcı fiziksel aktivite, sosyal beceri

# The Effect of Inclusive Physical Activities Applied to Children with Intellectual Dısabilities on Their Physical Activity Level and Social Skills


## ABSTRACT

The aim of this study was to examine the effects of inclusive physical activities on the physical activity level and social skills of children with intellectual disabilities (ID). 20 children with ID, 20 children with typically development (TD) and 15 volunteer university students participated in the study, which was designed in the pre-test – post-test experimental model. Children with and without ID were randomly divided into an application group (children with ID n: 10; children with TD n: 10) and a control group (children with ID n: 10; children with TD n: 10). In the study, inclusive physical activities were carried out for 40 minutes 3 days a week for 8 weeks with the children with and without ID in the application group with the support of volunteer university students. Inclusive physical activities in general; It consists of educational games, sports tracks, functional exercises, branch-specific activities, dance activities and movement training activities that can provide interaction with the group. Before the 8-week inclusive physical activities, volunteer university students were given volunteering trainings consisting of three stages: raising awareness, what to do before the application and what to do during the application. Study data were collected through the Personal Information Form, the Leisure Time Exercise Questionnaire and the Social Skills Assessment Scale. Data were analyzed, using Repeated Measures ANOVA test were used. The findings obtained within the scope of the study that the group* measurement joint effect on the physical activity level and social skill level of children with ID was significant. According to Bonferroni correction, while the post-test scores of the children with ID in the application group were significantly higher than their pre-test scores; It was determined that there was no significant difference between the pre-test and post-test scores of the children with ID in the control group. As a result, it was gained the impression that inclusive physical activities had a positive effect on the physical activity level and social skill level of the children with ID participating in the study. It is thought that supporting these results in future studies can guide teachers, coaches, experts and academicians who can use inclusive physical activities to increase the physical activity level and social skills level of children with ID.


**Keywords:** Intellectual disability, child, inclusive physical activity, social skills

## INTRODUCTION

Intellectual disability (ID) is defined as general mental functions below normal limits and deficits in two or more adaptive behaviors such as self-esteem, academic functions, social skills, self-care, and communication[1]. In addition to the difficulties experienced in these adaptive behaviors, individuals with ID also experience a number of cognitive difficulties that limit their ability to explore and interact with the environment[1]. These cognitive difficulties negatively affect individuals with ID in terms of social development[2] and limit their acceptance by their environment and peers[3]. Another area that is negatively affected by the developmental limitations of individuals with ID is the level of participation in physical activity of these individuals[4]. Previous studies reveal that individuals with ID have lower physical activity levels compared to their peers with typically developing (TD)[5-8].

Individuals with TD can generally take initiative in participating in physical activity and learning social skills by taking their family, adults and peers as models or through their own observations[9]. However, this situation is generally not possible for individuals with ID[10]. In order for individuals with ID to learn especially social skills, activities that include the participation of peers with TD that these individuals can take as models are needed[11]. Skills such as greeting, asking questions, and communicating are easily taught to these individuals through activities in which individuals with ID and peers with TD participate together[12]. In addition, physical activity levels of individuals with ID are supported in a fun environment through activities in which they participate with their peers with TD[13]. Participation of individuals with ID and peers with TD in activities together is also compatible with the principle of special education "participation of individuals with special needs with their peers with TD as much as possible during the education"[14].

Inclusive education is an educational approach that states that all children, with or without ID, should receive a qualified education to develop their social and academic skills. This approach facilitates the learning behavior of individuals with disabilities through their peer groups[15]. Inclusive education enables the increase of factors that support development in all individuals, whether they have a disability or not. In inclusive education programs, individuals' self-perception and friendship-making skills are supported through their interaction and communication with each other[16].

It is possible to find applications of inclusive education in all disciplinary fields. One of these areas is physical education. Inclusion in physical education is defined in the broadest sense as providing additional help and support from time to time so that children with and without ID can participate in physical activities together and benefit fully from the training[17]. The inclusion of children with ID in the inclusive physical education process has many positive effects on the developmental areas of these individuals[18]. It is stated that physical activities carried out with an inclusive approach make it easier for children with ID to establish new friendships and social adaptation[19-22].

Despite the positive effects of inclusive physical activities on the developmental areas of children with ID, when the literature is examined, there are a limited number of studies using inclusive physical activities to support the physical activity level and social skills of children with ID[19,20, 9]. In the current study, this gap in the literature was taken into account and it was aimed to test the effects of these activities on the physical activity level and social skills of children with ID by creating inclusive physical activities

in which children with and without ID could participate together. In the context of this purpose, the questions sought to be answered in the study are as follows:
1. Do the physical activity levels of children with ID in the application and control groups differ significantly between before and after 8 weeks of comprehensive physical activities?
2. Do the social skill levels of children with ID in the application and control groups show a significant difference between before and after 8 weeks of inclusive physical activities?

## MATERIAL AND METHODS

### Research Model

This study, which examined the effects of inclusive physical activities on the physical activity level and social skills of children with ID, was designed in an experimental model with a pre-test - post-test control group. In this model; a training, activity or intervention program is applied to the application group and it is evaluated whether the feature to be measured changes between before and after the study[23]. If the post-study scores are higher than the pre-test scores, it is stated that this is due to the training, activity or intervention program discussed in the study[24]. Information about the implementation process in the context of the research model of the current study is presented in Table 1.

**Table 1**. Information on the Research Model and Application Process of the Study

| Group | Volunteer training | Pre-test | Inclusive Physical Activities | Post-test |
|---|---|---|---|---|
| Application | Volunteer training consisting of 5 sessions for 1 week was organized for 15 volunteer university students. | Participants' physical activity level and social skills were evaluated before inclusive physical activities. | Participants in the application group were given 40-minute inclusive physical activities 3 days a week for 8 weeks. | Participants' physical activity level and social skills were evaluated after the inclusive physical activities. |
| Control | | Participants' physical activity level and social skills were evaluated before inclusive physical activities. | The control group did not take part in any physical activity program during this period. | Participants' physical activity level and social skills were evaluated after the inclusive physical activities. |

As seen in Table 1, in the current study, an application group and a control group were included in accordance with the experimental model with pre-test - post-test control group. In order to carry out the inclusive physical activities in the study more effectively and regularly, 15 volunteer university students were included in the study. Before the activities, volunteer trainings consisting of 5 sessions were organized for 1 week for volunteer university students. Within the scope of volunteer training, university students were given theoretical and practical training on awareness, preparations before physical activity implementation, and what to do during physical activity implementation. Following the completion of the volunteer training, pre-test data on the physical activity level and social skills of all children in the application and control groups were obtained. Then, 40-minute inclusive physical activities were carried out with the children in the application group, three days a week for 8 weeks. After 8 weeks

of inclusive physical activities, post-test data on the physical activity level and social skills of all children in the application and control groups were collected.

**Participants**

There are three different participant groups in the study: children with ID, peers with TD and volunteer university students. Information about the personal characteristics of each participant group and the selection process are presented in the subheadings below.

**Children with ID**

20 children between the ages of 4 and 6 who were officially diagnosed with ID participated in the study. Children with ID receive pre-school education in general education and special education kindergartens in the city center of Bayburt, affiliated with the Ministry of National Education. In addition, children with ID receive support training at a special education and rehabilitation center on certain days and hours of the week. Criterion sampling method was used in the process of identifying children with ID. Criterion sampling method is the sampling of people who meet certain criteria for participation in line with a set of predetermined criteria[25]. In this context, a number of inclusion criteria were included in the process of identifying the children with ID included in the current study, in line with expert opinions. The inclusion criteria are as follows:

- ✓ Being officially diagnosed with ID,
- ✓ Being between the ages of 4-6,
- ✓ Not having any health problems that would prevent participation in physical activities,
- ✓ Not having participated in any regular physical activity, exercise or sports program before.

In line with the determined inclusion criteria, interviews were held with school administrators of general education and special education kindergartens in Bayburt city center in order to reach children with ID and their parents. During these meetings, the purpose and content of the study were explained and support was requested to reach the children and their parents. Under the guidance of school administrators, parents of children with ID were interviewed and the purpose, content and inclusion criteria of the study were explained to them. As a result of interviews with parents, 20 children aged 4-6 years old who met the inclusion criteria were included in the study as participants by obtaining a consent form from their parents. Children with ID participating in the study were randomly divided into two groups: an application group (n: 10) and a control group (n: 10). Demographic characteristics of children with ID are presented in Table 2.

**Table 2.** Demographic Characteristics of Children with ID

| | Groups | |
|---|---|---|
| | Application (n: 10) n(%) | Control (n: 10) n(%) |
| Gender | | |
| Girl | 5(%50) | 6(%60) |
| Boy | 5(%50) | 4(%40) |
| Age (M+SD) | 5.4+0.69 | 5.2+1.02 |
| Diagnosis | | |
| Mild ID | 6(%60) | 8(%80) |
| Moderate ID | 4(%40) | 2(%20) |
| Parent Education Level | | |
| Primary School | 2(%20) | 1(%10) |
| Secondary School | 4(%40) | 6(%60) |
| High School | 3(%30) | 2(%20) |
| University | 1(%10) | 1(%10) |
| Perceived Family Income Level | | |
| Moderate | 8(%80) | 7(%70) |
| High | 2(%20) | 3(%30) |

ID: Intellectual Disability

As seen in Table 2, 5 of the children with ID in the application group participating in the study were girls and 5 of them were boys, while the children with ID in the control group were 6 girls and 4 boys. In terms of age, the average age of children with ID in the application group is 5.4, while the average age of children with intellectual disabilities in the control group is 5.2. In terms of diagnosis, 6 of the children in the application group had mild ID and 4 had moderate ID, while 8 of the children in the control group had mild ID and 2 had moderate ID. In terms of parent education level, 2 of the parents in the application group are primary school graduates, 4 secondary school graduates, 3 high school graduates and 1 university graduate, while in the control group 1 parent is primary school graduate, 6 secondary school graduate, 2 is high school graduate and 1 is university graduate. is a graduate. In terms of perceived income level, 8 of the children with ID in the application group were in the moderate income level and 2 were in the high income level, while 7 of the children with ID in the control group were in the moderate income level and 3 were in the high income level.

**Peers with TD**

In order to carry out the physical activities in the study with an inclusive approach, 20 Peers with TD aged 4-6 were included in the study. Children with TD attend pre-school education in general education kindergartens and kindergartens in Bayburt city center under the Ministry of National Education. Criterion sampling method was used in the process of identifying children with TD. In this context, a number of inclusion criteria were used in line with expert opinions in the process of determining the children with TD included in the current study. These criteria are presented below.

- ✓ Being between the ages of 4-6,
- ✓ Not having any health problems that would prevent participation in physical activities,
- ✓ Having good social interaction and communication skills,
- ✓ No behavioral problems,
- ✓ Not having participated in any regular physical activity, exercise or sports program before.

In order to identify peers with TD in the context of the inclusion criteria mentioned above, school administrators of general education kindergartens and classes in Bayburt city center were interviewed. During the interviews, the purpose, content and inclusion criteria of the study were explained and support was requested to reach the children and their parents. Parents were contacted with the help of school administrators and the purpose, content and inclusion criteria of the study were explained to them. As a result of interviews with parents, 20 children with TD between the ages of 4-6 who met the inclusion criteria were determined as participants by obtaining permission forms from their parents. Children with TD participating in the study were randomly assigned to two groups: an application group (n: 10) and a control group (n: 10).

**Volunteer University Students**

In order to carry out the inclusive physical activities within the scope of the study more effectively and regularly, 15 university students were included in the implementation process. Convenient sampling method was used to determine volunteer university students. According to Yıldırım and Şimşek (2008)[25], the easily accessible sampling method refers to selecting a sample group that is easier to reach in order to speed up and make academic work practical. In this context, 15 volunteer university students were selected from among the students studying at Bayburt University, Faculty of Sports Sciences, where the researcher received his master's degree. Volunteer training was given to the selected students before the implementation of inclusive physical activities.

In the preparation of volunteer trainings, studies in the literature were first examined[26]. In line with the studies examined, a draft volunteer training content was created. The draft content was presented to the opinions and suggestions of two academicians who are experts in the field of ID and physical education. Volunteer trainings finalized in line with expert opinions and suggestions; It consists of the subheadings of awareness raising, preparations before implementation and things to do during implementation. The trainings under the subheadings included not only theoretical processes but also practical processes. Volunteer university students took on the roles of children and educators and mutually demonstrated the skills they acquired during the training.

**Inclusive Physical Activities**

The concept of inclusive physical activity is defined in its broadest sense as physical education and sports, games and exercise activities in which individuals with and without special needs participate together[21,22]. In this context, in the current study, physical activities were created in which children with and without ID could participate together. In the process of creating physical activities, firstly, studies in the literature containing inclusive physical activity examples were examined[27,21,9]. A draft physical activity program was created in line with the literature. The draft program was given its final form under the supervision of two academicians who are experts in physical education and sports activities for individuals with special needs. Inclusive physical activities consisted of 3 parts: warm-up (approximately 10 minutes), main activity (approximately 20 minutes) and cool-down (approximately 10 minutes). In the warm-up section; jogging, walks, stretching movements with a partner and music, and activities aimed at rotation of the joints were used. In the main activity section; Educational games, sports tracks, functional exercises, branch-specific activities, dance activities and movement training activities were carried out. Activities carried out

in the main section include trampolines, plate balls, football balls, basketballs, tennis balls, cushions, castles, hoops, slalom bars, training stairs, speed rings, funnels, training bowls, bean bags, sensory integration materials, tunnels, hula hoops, obstacles. Rich learning materials such as sets and balance boards were used. In the cooling section; walks and stretching movements were performed.

**Data Collection Tools**

Within the scope of the study, data were obtained through 1) Personal Information Form, 2) Leisure Time Exercise Questionnaire and 3) Social Skills Assessment Scale. Gender, age, diagnosis, educational status, parental education level and perceived family income level with the Personal Information Form.

Leisure Time Exercise Questionnaire: Within the scope of the study, the Leisure Time Exercise Questionnaire developed by Godin and Shephard (1985)[28] was used to examine the physical activity level of individuals with ID. The Leisure Time Exercise Questionnaire is used to evaluate how physically active individuals are in their free time. Turkish adaptation studies of the questionnaire were carried out by Yerlisu-Lapa et al. (2016)[29]. Exploratory Factor Analysis conducted in the adaptation study revealed a single-factor structure that explained 55% of the total variance. The test-retest reliability coefficient of the Turkish version was found to be .84 for the entire survey and .80, .76 and .72 for the questionnaire items, respectively. In addition, the 'International Physical Activity Questionnaire Short Form' was used for criterion validity and the Spearman correlation coefficient was calculated as .92. The questionnaire includes questions about physical activity performed in free time for at least 15 minutes in the last seven days and in the last week; It aims to determine the number of times a) Strenuous physical activities, b) Moderate physical activities and c) mild intensity physical activities are performed. The calculation method is as follows; Weekly leisure activity score= (9 x Strenuous intensity) + (5 x moderate intensity) + (3 x mild intensity). By collecting the measured values, it is examined to what extent the individual is physically active during free time. In this evaluation; 24 and above is considered as "active", between 14 and 23: "moderately active", and 13 and below: "not active enough"[30]. Within the scope of the current study, the Cronbach Alpha reliability coefficient regarding the reliability of the questionnaire was calculated. The Cronbach Alpha reliability coefficient for the scores obtained by children with ID from the Leisure Time Exercise Questionnaire was found to be 0.79.

Social Skills Assessment Scale: Social Skills Assessment Scale was used to evaluate the social skills of the children with ID participating in the study. The scale developed by Akçamete and Avcıoğlu (2005)[31] consists of 69 items and 12 subsections in 5-point Likert style. In the current study, the total score of the scale was used. Within the scope of the validity and reliability study of the scale, varimax orthogonal rotation technique was first applied. Within the scope of the reliability study of the scale, the Cronbach Alpha coefficient for the overall scale was calculated and the Cronbach Alpha value for the overall scale was determined as 0.98. Within the scope of the current study, the Cronbach Alpha reliability coefficient regarding the reliability of the scale was calculated. The Cronbach Alpha reliability coefficient for the scores obtained by children with ID from the Social Skills Assessment Scale was found to be 0.81.

### Analysis of Data

SPSS 20.0 statistical package program was used to analyze the data obtained within the scope of the study. The analysis process started by evaluating whether the data showed a normal distribution. Shapiro Wilk test, Skewness and Kurtosis values, Levene Test and Box's M test were used to evaluate the normality of the data[32]. When the Shapiro Wilk test, Skewness-Kurtosis values, Levene test and Box's M test values were evaluated as a whole, it was determined that the necessary assumptions for the use of the Repeated Measures ANOVA test were met in comparing the physical activity level and social skill level of the children in the application and control groups.

## RESULTS

In this section, findings regarding the problem statements for which answers were sought in the study are presented in line with the general purpose of the study. In the presentation of the findings, first the descriptive statistical results and then the results regarding the problem statements are included.

### Descriptive Statistical Results

The mean and standard deviation values of the pre-test and post-test scores received by the children in the application and control groups from the Leisure Time Exercise Quastionnaire (LTEQ) and Social Skills Assessment Scale (SSAS) are shown in Table 3.

**Table 3.** Descriptive Results Regarding the Pre-Test and Post-Test Scores of Children in the Application and Control Groups from LTEQ and SSAS

| | | | Pre-test | | Post-test | |
|---|---|---|---|---|---|---|
| | Groups | N | X | Sd | X | Ss |
| LTEQ | Application | 10 | 12.90 | 5.27 | 31.20 | 4.98 |
| | Control | 10 | 13.50 | 4.99 | 13.30 | 5.45 |
| SSAS | Application | 10 | 144.20 | 26.96 | 185.10 | 17.91 |
| | Control | 10 | 147.80 | 13.65 | 151.30 | 20.57 |

As seen in Table 3, the mean of the pre-test scores obtained from LTEQ by the children with ID in the application group is 12.90, the standard deviation is 5.27, and the mean of the post-test scores is 31.20 and the standard deviation is 4.98. The mean of the LTEQ pre-test scores of the children with ID in the control group is 13.50, the standard deviation is 4.99, and the mean of the post-test scores is 13.30 and the standard deviation is 5.45. In addition, the mean of the pre-test scores obtained from the SSAS of the children with ID in the application group is 144.20, the standard deviation is 26.96, and the mean of the post-test scores is 185.10, the standard deviation is 17.91. The mean of the pre-test scores of the children with ID in the control group on SSAS is 147.80, the standard deviation is 13.65, and the mean of the post-test scores is 151.30, the standard deviation is 20.57.

### Results Regarding the First Sub-Problem Sentence of the Study

Do the physical activity levels of children with ID in the application and control groups differ significantly between before and after 8 weeks of comprehensive physical activities?

**Table 4.** ANOVA Results Regarding the Physical Activity Level Pre-Test and Post-Test Scores of Children with ID in the Application and Control Groups

| Source | Sum of Squares | Sd | Mean of Squares | F | p | $n^2$ |
|---|---|---|---|---|---|---|
| Between Groups | | | | | | |
| Group (Application/control) | 748.225 | 1 | 748.225 | 24.212 | 0.000* | 0.574 |
| Error | 556.250 | 18 | 30.903 | | | |
| Within Groups | | | | | | |
| Measurement (Pre/Post) | 819.025 | 1 | 819.025 | 35.883 | 0.000* | 0.666 |
| Group* Measurement | 855.625 | 1 | 855.625 | 37.486 | 0.000* | 0.676 |
| Error | 410.850 | 18 | 22.825 | | | |

*p<0.05

When Table 4 was examined, it was determined that there was a significant difference in terms of group effect between the average scores obtained from LTEQ by the children with ID in the application and control groups, without distinguishing between the pre-test and post-test scores ($F_{(1, 18)} = 24.212$; $p< 0.05$). Likewise, it was determined that there was a significant difference in terms of measurement effect between the averages of pre-test and post-test scores obtained from LTEQ by children with ID in the application and control groups, regardless of group ($F_{(1, 18)}= 35.883$; $p<0.05$). In addition, the joint effect of group and measurement was also found to be significant ($F_{(1, 18)}= 37.486$; $p<0.05$). This finding shows that the scores obtained by the children with ID in the application and control groups in the pre-test and post-test measurements on LTEQ did not differ. Corrected Bonferroni values were used to examine the source of the difference in the LTEQ scores of children with ID in the application and control groups over time (Table 5).

**Table 5.** Corrected Bonferroni Values for Pre-Test and Post-Test Scores of Physical Activity Level of Children with ID in the Application and Control Groups

| Groups | Measurement | | Difference | p |
|---|---|---|---|---|
| Application | Pre-test | Post-test | -18.300 | 0.000* |
| | Post-test | Pre-test | 18.300 | |
| Control | Pre-test | Post-test | 0.200 | 0.933 |
| | Post-test | Pre-test | -0.200 | |

*p<0.05

As seen in Table 5, it was determined that there was a significant increase in the post-test scores of the children with ID in the application group compared to the pre-test scores (corrected Bonferroni = $p<0.05$, Difference = +18.300). On the other hand, it was determined that the post-test scores of the children with ID in the control group did not show a significant increase compared to the pre-test scores (Bonferroni correction = $p>0.05$, Difference: -0.200). The interaction graph containing the findings regarding the physical activity level of children with ID in the application and control groups is presented in Figure 1.

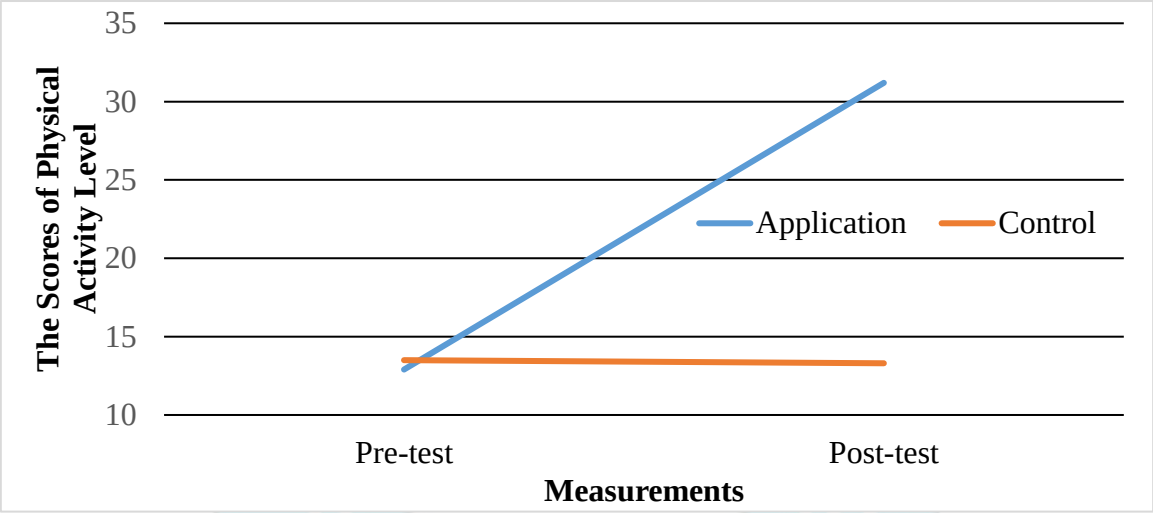


**Figure 1.** Graph of Average Scores for Physical Activity Levels of Children with ID in the Application and Control Groups

When Figure 1 is examined, it is seen that there is a significant increase between the pre-test and post-test physical activity scores of the children with ID in the application group. On the other hand, it was determined that there was no significant increase between the pre-test and post-test physical activity scores of the children with ID in the control group. When the findings obtained from the ANOVA test and the interaction graph were evaluated as a whole within the scope of the study, it was obtained the impression that 8-week inclusive physical activities had a positive and significant effect on the physical activity level of children with ID in the application group.

**Results Regarding the Second Sub-Problem Sentence of the Study**

Do the social skill levels of children with ID in the application and control groups show a significant difference between before and after 8 weeks of inclusive physical activities?

**Table 6.** ANOVA Results Regarding the Social Skill Level Pre-Test and Post-Test Scores of Children with ID in the Application and Control Groups

| Source | Sum of Squares | Sd | Mean of Squares | F | p | $n^2$ |
|---|---|---|---|---|---|---|
| Between Groups | | | | | | |
| Group (Application/control) | 2280.100 | 1 | 2280.100 | 5.509 | 0.031* | 0.234 |
| Error | 7449.500 | 18 | 413.861 | | | |
| Within Groups | | | | | | |
| Measurement (Pre/Post) | 4928.400 | 1 | 4928.400 | 11.878 | 0.003* | 0.398 |
| Group* Measurement | 3496.900 | 1 | 3496.900 | 8.428 | 0.009* | 0.319 |
| Error | 7468.700 | 18 | 414.928 | | | |

*p<0.05

When Table 6 was examined, it was seen that there was a significant difference in terms of group effect between the average scores of the children with ID in the application and control groups, obtained from the SSAS, without distinguishing between the pre-test and post-test scores ($F_{(1, 18)}$= 5.509; p<0.05). Likewise, it was determined that there was a significant difference in terms of measurement effect between the mean pre-test and post-test scores of the children with ID in the application and control groups, regardless of group, obtained from the SSAS ($F_{(1, 18)}$= 11.878; p<0.05). In addition, the joint effect of group and measurement was also found

to be significant ($F_{(1, 18)}$= 8.428; p<0.05). This finding shows that the scores obtained by the children with ID in the application and control groups in the pre-test and post-test measurements on the SSAS did not differ. Corrected Bonferroni values were used to examine the source of the difference in the scores obtained by the children with ID in the application and control groups over time on the SSAS (Table 7).

**Table 7.** Corrected Bonferroni Values for the Social Skills Level Pre-Test and Post-Test Scores of Children with ID in the Application and Control Groups

| Groups | Measurement | | Difference | p |
|---|---|---|---|---|
| Application | Pre-test | Post-test | -40.900 | 0.002* |
| | Post-test | Pre-test | 40.900 | |
| Control | Pre-test | Post-test | -3.500 | 0.691 |
| | Post-test | Pre-test | 3.500 | |

*p<0.05

As seen in Table 7, it was determined that there was a significant increase in the post-test scores of the children with ID in the application group compared to the pre-test scores (corrected Bonferroni = p<0.05, Difference = +40.900). On the other hand, it was determined that the post-test scores of the children with ID in the control group did not show a significant increase compared to the pre-test scores (Bonferroni correction= p>0.05, Difference: +3.500). The interaction graph containing the findings regarding the social skill levels of children with ID in the application and control groups is presented in Figure 2.

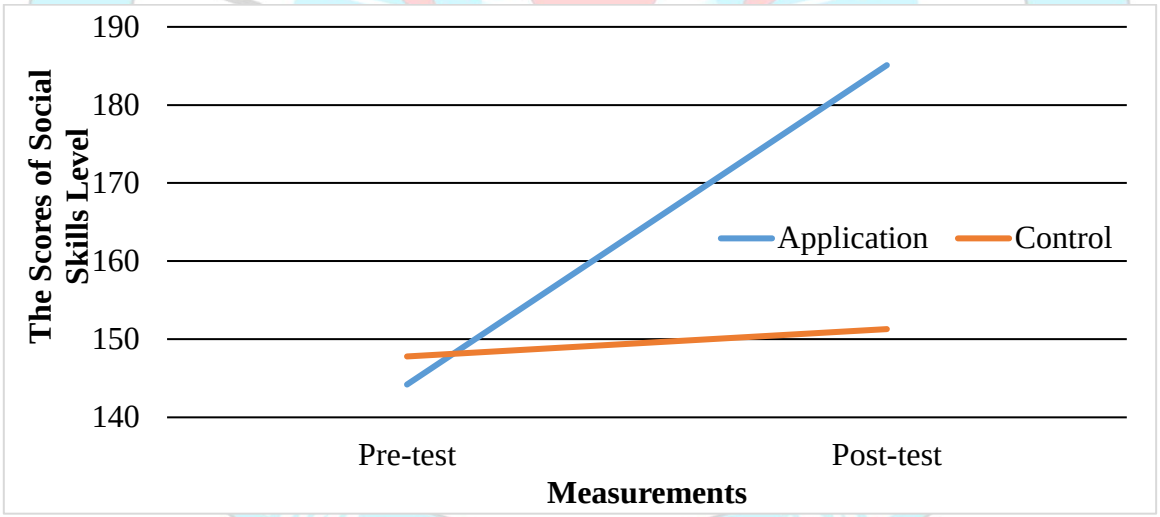


**Figure 2.** Graph of Average Scores for the Social Skills Levels of Children with ID in the Application and Control Groups

When Figure 2 is examined, it is determined that there is a significant increase between the pre-test and post-test social skill scores of the children with ID in the application group. On the other hand, it was found that there was no significant increase between the pre-test and post-test social skill scores of the children with ID in the control group. When the findings obtained from the ANOVA test and the interaction graph were evaluated as a whole within the scope of the study, it was obtained the impression that 8-week inclusive physical activities had a positive and significant effect on the social skill level of the children with ID in the application group.

## DISCUSSION

In this research, physical activities are presented with an inclusive approach with the participation of children with TD in terms of the physical activity level and development of social skills of children with ID. Today, including peer with TD participation in the education process of individuals with special needs; It is recommended for use in different disciplines such as physics education[33], rehabilitation[34], medicine[35] and nursing[36]. Another area where peer with TD participation is recommended is physical education[37]. It is emphasized that ensuring peer with TD participation in physical activities organized for individuals with special needs will make positive contributions to the different developmental characteristics of individuals with special needs[38]. This process, also called inclusive physical activities, not only supports the developmental characteristics of children with and without special needs, but also contributes to the development of mutual interaction and communication skills between these individuals[39].

Inclusive physical activities were carried out with children with and without ID for 8 weeks in the current research. As a result of the study, it was determined that inclusive physical activities had positive effects on the physical activity and social skill levels of children with ID. This result obtained; It is similar to the results of previous studies revealing the positive effects of physical education, sports, games and exercise-based physical activities organized with an inclusive approach on the physical activity level and social skills of children with[20,9.] In the relevant literature, it is also possible to come across studies suggesting that physical education, sports, games and exercise-based physical activities have positive effects on the physical activity level and social skills of children with ID, even though TD does not include peer participation[40-49]. When the literature was examined, it was seen that, although limited, there were studies that used inclusive physical activities to support the developmental areas of children with autism spectrum disorder, as well as ID[50-55.]

As a result of the current research, it was concluded that, in line with the literature, the physical activity level and social skills of children with ID who participated in inclusive physical activities showed positive changes. It is thought that the results of the study can contribute to the inclusion of children with ID in inclusive education in physical education and sports environments by creating exemplary situations for educators, experts and researchers who have the potential to work with children with ID[14].

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