

## **The Benefits of Unified Football in Children with Mental Disabilities. A Pilot Study**

### **Beneficiile Fotbalului Unificat la Copiii cu Dizabilități Mintale. Studiu Pilot**

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#### **Abstract**

*Introduction:* The game has a key role in the development of children, but even more so in children with functional and special needs. To be able to play is a right and a duty, both in the case of physical disability and mental disability, because in addition to being a way to facilitate inclusion with other children, it can also be a powerful tool for the rehabilitation of various physical and mental deficits given by the functional diversity presented by each child; *Objective:* The main purpose of the paper was to test and evaluate the aerobic fitness, the maximum oxygen absorption and the evaluation by specific tests of the level of practical expression of skill in children with special needs; as well as the evaluation of the degree of social inclusion of children with disabilities through the method of the unified football game; *Methods:* Two groups of 6 children each were included in the study and participated in the Special Olympics Unified Football Championships, and during the training sessions they were tested using the Cooper Test, the adapted version for children with special needs and were questioned before and after training on social inclusion; *Conclusion:* The results recorded by students with special needs showed a statistically significant development of aerobic fitness and a significantly higher degree of social inclusion and empathy following the unified game.

**Keywords:** *disability, unified sports, children with special needs*

#### **Rezumat**

*Introducere:* Jocul are un rol cheie în dezvoltarea copiilor, dar cu atât mai mult la copiii cu nevoi funcționale și speciale. Jocul, este un drept și o datorie, atât caz de handicap fizic cât și de handicap mental, deoarece în afară de ceea ce înseamnă o modalitate de facilitare a incluziunii cu alți copii, poate reprezenta și un instrument puternic pentru reabilitarea

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diferitelor deficite fizice și mentale date de diversitatea funcțională prezentată de fiecare copil; *Obiectiv:* Scopul principal al lucrării a fost testarea și evaluarea fitness-ului aerob, a absorbției maxime de oxigen și evaluarea prin teste specifice a nivelului de exprimare practică a îndemânării la copii cu nevoi speciale; precum și evaluarea gradului de incluziune socială a copiilor cu dizabilități prin metoda jocului de fotbal unificat; *Metode:* Două loturi de câte 6 copii au fost incluse în studiu și au participat la campionatele de fotbal unificat Special Olympics, iar pe durata antrenamentelor au fost testați folosind Testul Cooper varianta adaptată pentru copii cu nevoi speciale și au fost chestionați înainte și după antrenamente referitor la incluziunea socială; *Concluzii:* Rezultatele înregistrate de către elevii cu nevoi speciale participanți arată o dezvoltare semnificativă din punct de vedere statistic a fitness-ului aerob și un nivel semnificativ mai ridicat de incluziune socială și empatie în urma practicării jocului unificat.

***Cuvinte cheie:*** dizabilitate, sport unificat, copii cu nevoi speciale

## **Introduction**

Even if it does not receive the attention it deserves, play has an essential role in children's development, both cognitively and emotionally, as well as physically. Through games, children practically know the world around them and experience situations that can occur in real life. Depending on the age, the child will respond to certain games and will get acquainted with various situations through play [1-3]. The game helps children build team spirit and teaches children to behave nicely with each other. A study published in 2009 [4] in the Journal of Early Childhood Education revealed that free play or adult-guided play helps preschoolers become aware of the feelings of those around them. The game also helps them learn to control their own emotions, a skill that will be useful throughout their lives. The fact that they can experience new things without suffering because of the consequences of their actions is a huge benefit for children, according to psychologists. They also claim that play allows children to learn certain roles and learn social rules, and this benefit cannot be neglected either.

It's no secret that football has received its fair share of negative publicity. There has been a strong push to inform current and potential players about the dangers of the sport, especially head injuries. But despite the obvious risks of injury, we believe that football remains one of the most rewarding sports a child can play. The game of football, like other sports, offers various health benefits for a child. It is a physically demanding game that offers players an opportunity to improve their speed, agility, endurance, hand-eye coordination and overall cardiovascular endurance.

The friendship built between a team of football players is different from any other sport due to the large volume of teammates. With dozens of players working towards a common goal, a connection

that children develop with each other, it is invaluable. This camaraderie is a lifelong benefit for children, as they will quickly appreciate the importance of developing close relationships with others. Football is a game of stature and this margin of error requires special attention to detail from everyone on the field. A wrong step, a past step or a mental error can negatively affect any given game. Children who play football will learn the importance of discipline in everything they do. Football is truly a team game. With more players on each side of the ball, everyone is considered to play their individual role. There is a great deal of responsibility required for each player to have a specific role in each game. This teamwork helps children get used to working with others, a skill needed in almost all professions.

In addition to physical endurance, it takes a great mind to play football. Whether they are struggling with minor injury or overcoming adversity after an attack or a mistake, children often develop mental resilience that they may never otherwise discover. The game has a key role in the development of children, but even more so in children with functional and special needs. Because, in addition to representing a way of socio-educational learning, they are an effective tool for psychomotor stimulation to improve their development. Numerous scientific studies show that children's play facilitates the child's creative development and personality.

But when we talk about children with a kind of physical and mental disability, play can become therapeutic, because it is a multisensory channel that brings them benefits at the level: motor, sensory, cognitive, social, and emotional. The game has a key role in the development of children, but even more so in children with functional and special needs [5]. Because, in addition to representing a way of socio-educational learning [1-3], they are an effective tool for psychomotor stimulation to improve their development.

Numerous scientific studies show that children's play facilitates the child's creative development and personality, but we must also take into account a number of general and specific recommendations related to the selection and adaptation of toys for children with physical and mental disabilities. Some authors point out that a common ground that underlies children's play is extremely important, just as the design of the toy is "design for all", so that children with and without disabilities can use the same games in similar or shared conditions [6-10].

As the present study shows, the unified football game can offer children with mental disabilities multiple benefits, provided that they are adapted to their needs for physical and psychosocial development. Play, as we know, is a right and a duty, both in the case of physical disability and mental disability, because in addition to what it means to facilitate inclusion with other children, it can also be a tool strong for rehabilitation the various physical and mental deficits given by the functional diversity presented by each child.

*The hypotheses from which this study was based were the following:*

- The capacity of aerobic fitness can be significantly developed through the method of the unified football game.
- The level of social inclusion of children with special needs can be significantly improved by the unified football game method.

The first goal set is to test and evaluate aerobic capacity / aerobic fitness and maximum oxygen absorption. The second objective focuses on assessing the degree of social inclusion of children with disabilities through the method of the unified football game.

## **Material and Method**

### *Study design*

In order to achieve the objectives and test the hypothesis of our study, the students of the football team of the School Center for Inclusive Education No. 2 in Târgu Mureș, and the students of the football team of the National College "Unirea" Gymnasium Târgu Mureș trained together for participating in the unified football championship held by the Special Olympics Romania Foundation. The representative football team of the School Center for Inclusive Education No. 2 consists of students aged between 12 and 14 and performs two training sessions per week on the school sports field.

The research took place for 9 weeks between September 22 and December 15, 2019. The planning and scheduling of the training of the group of students included two trainings per week. During each training, they were allocated time to perform exercises in order to develop skill and endurance. The exercises proposed in this regard are specific to the game of football or include certain movements, actions, elements or technical procedures specific to the game. After consulting the literature in the field, some of the exercises were collected from the bibliographic materials studied and others were designed or adapted specifically to the medical condition (diagnosis) of students and the material base / conditions available in the school sports base. The initial testing was performed on September 22 and the final testing on December 15, 2019.

The first group of subjects of this study were students with special needs with a medium degree of mental disability, members of the football team of the School Center for Inclusive Education No. 2 in Târgu Mureș. The football team of the school trained in order to participate in the local, regional and national school championships, including the championship organized by the Special Olympics Romania Foundation. The students members of the representative team were selected following the annual organization of the school football championship, but also following the continuous selection made by the physical education teacher and the physiotherapist of the school.

The second group of subjects of this research are students without disabilities members of the football team of the Gymnasium of the National College "Unirea" Târgu Mureş.

All members of the representative teams performed the medical check-up, without which they cannot participate in competitions.

*Table1. Table of students with special needs members of the football team of the School Center for Inclusive Education No. 2 in Târgu Mureş*

<b>No. of students</b>	<b>Age</b>	<b>Gender</b>	<b>Handicap degree</b>	<b>Primary / secondary diagnosis</b>	<b>No. of diagnostics</b>
Subject 1	12 years	Male	Medium	Moderate mental retardation	1
Subject 2	12 years	Male	Medium	Moderate mental retardation	1
Subject 3	13 years	Male	Medium	Severe delay in the development of expressive language	1
Subject 4	13 years	Male	Medium	Moderate mental retardation, Moderate delay in language development	2
Subject 5	13 years	Male	Medium	Moderate mental retardation, Behavioral disorders	2
Subject 6	13 years	Male	Medium	Moderate mental retardation, Behavioral disorders	2

*Inclusion criteria:*

- Students aged 12-14 years;
- The favorable opinion of the three institutions for participating in this unified football game championship;
- The agreement of the parents / guardians / legal representatives of the students;
- The approval of the doctor of the school cabinet of the 2 institutions, for participating in sports activities.

*Table 2. Table of students without disabilities, members of the football team of the "Unirea" National College Gymnasium, Târgu Mureş*

<b>No of students</b>	<b>Age</b>	<b>Gender</b>
Subject 1	12 years	Male
Subject 2	12 years	Male
Subject 3	13 years	Male
Subject 4	13 years	Male
Subject 5	13 years	Male
Subject 6	14 years	Male

When choosing the subjects, the Regulations of the Unified National Football Championship [11] were taken into account and respected. Also, for the favorable approach of this evaluation I collaborated in the multidisciplinary team with the psychologist of the National College "Unirea", doctors of the

schools of the institutions involved and with the psychologist, physiotherapist of the School Center for Inclusive Education.

*Complex model of adapted physical exercises in our study:*

- *Working group:* value groups; running in varied tempo: 40 m tempo 2/4, 30 m running tempo 3/4; 20 m running 4/4, 40 m running tempo 2/4, 60 m walking, 3-4 x, active break 2-3 min (the 60 m walking) [12].
- *Work training:* students are divided into value groups; 100 m run time 2/4, 100 m run time 3/4; 20 m running tempo 4/4, 100 m walking 3-4 x, active break 3-3 ½ min [12].

The following tests were implemented at the initial and final evaluation:

### **1. Cooper Test**

**Standard Cooper Test** is a maximum test of physical fitness, which falls within the range of aerobic endurance tests [13]. It was designed by Kenneth H. Cooper in 1968 for testing and use in the US military sector [13, 14]. In its original form, the purpose of the test is to assess / test your aerobic / fitness for running as much as possible within 12 minutes. Rhythm is important because the participant will not cover a maximum distance if he starts with a pace too close to a full sprint. The result is based on the distance traveled by the person being tested, their age and gender.

**Adapted Cooper Test.** As the study group of this research consisted of including children with special needs, we decided to adapt the Standard Cooper Test as follows:

- In order to prevent injuries, the test was performed in the physical activity / sports room.
- The duration of the test has been changed, the standard time of 12 minutes, has been adapted to a time of 6 minutes.

### **2. Assessment of social inclusion**

- For a clearer reflection of the level of acceptance of children with special needs, we designed a questionnaire with 10 questions that assesses the opinion of students at the National College "Union" on the interaction with children with disabilities. This questionnaire was applied to students before and after training.
- Also for the evaluation of the level of social inclusion, we designed a questionnaire of 8 questions which evaluates the opinion of students with special needs with a medium degree of disability, members of the football team of the School Center for Inclusive Education No. 2 in Târgu Mureș interaction with children who do not have disabilities. This questionnaire was applied to students before and after training.
- A scoring system was not developed for the interpretation of the questionnaire, but the interpretation was based on the frequency of answers to the questions in the questionnaire.

### **Analysis and Interpretation of Results**

GraphPad Prism V.6.0 statistical software was used to statistically process the data. Significance tests for independent and dependent data were applied. The Kolmogorov Smirnov test was used to test the normality of the distribution curves of the measured variables. The significance tests applied were the Student's t test for paired and unpaired data. To compare the proportions we used the Chi square for trend test. The significance threshold chosen was  $\alpha = 0.05$ , considering statistical significance when  $p$  was less than or equal to  $\alpha = 0.05$ . The results are expressed as absolute frequencies, relative frequencies, mean  $\pm$  DS (standard deviation).

### **Results**

#### **Interpretation of results for the Cooper Test**

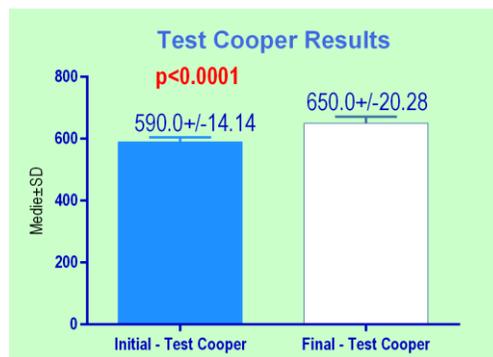


Figure 1. Comparison of Cooper Test Results - total sample (distance traveled in meters)

In Figure 1, the comparison of the results obtained at the Cooper Test for the total group of children with special needs, the results of the initial test and the results of the final test after training are highlighted. It can be seen that there is a statistically significant difference between the averages of the results before and after, 590.0  $\pm$  14.14 meters vs. 650.0  $\pm$  20.28 meters,  $p < 0.0001$ , which means that the children's fitness improved after the training period, as they ran several meters in the final Cooper test.

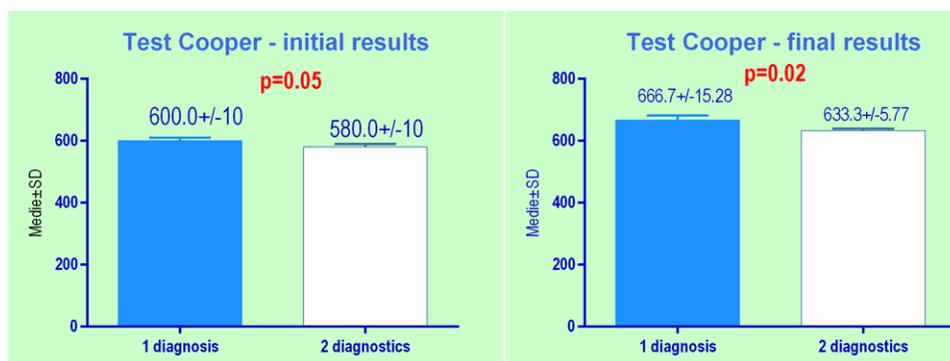


Figure 2. Comparison of initial and final Cooper Test Results according to number of diagnostics (distance in meters)

Comparison of the results of the initial Cooper Test according to number of diagnosis is shown in Figure 2, noting a significant difference between the outcome of children with a diagnosis and the outcome of children with 2 diagnoses (600.0 +/- 10 meters vs. 580 +/- 10 meters,  $p = 0.05$ ), indicating that children with a diagnosis they ran a longer distance in 6 minutes, compared to children with 2 diagnoses.

Comparison of the results of the final Cooper Test according to number of diagnosis is shown in Figure 2, noting a significant difference between the outcome of children with a diagnosis and the outcome of children with 2 diagnoses (667.0 +/- 15.28 meters vs. 633 +/- 5.77 meters,  $p = 0.02$ ), indicating that although the result improved from the initial test in all students, children with a diagnosis ran a significantly longer distance in 6 minutes, compared to children with 2 diagnoses.

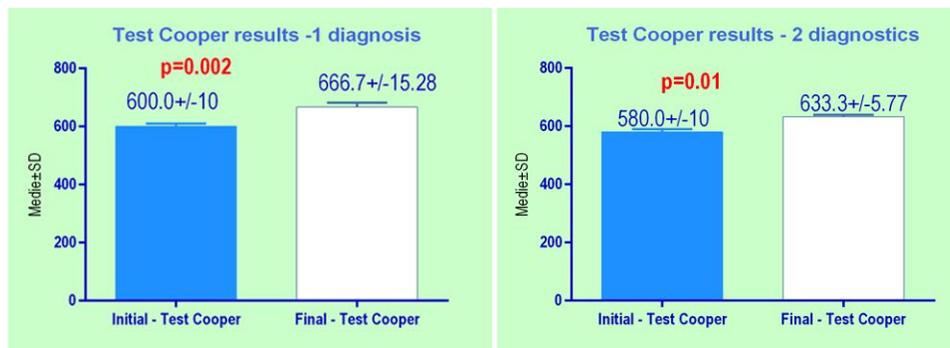


Figure 3. Comparison of Cooper Test results in children with 1 and 2 diagnostics (distance in meters)

Figure 3. highlights the results of children with a single diagnosis on the initial Cooper test, indicating that the results improved statistically significantly from the initial test to the final test, with children running a significantly longer distance to the final test that took place after unified training (600.0 +/- 10 meters vs. 666.7 +/- 15.28 meters,  $p = 0.002$ ). Also, Figure 3 shows the results of children with two diagnoses on the initial Cooper test, indicating that the results improved statistically significantly from the initial test to the final test, with children running a significantly longer distance to the final test that took place after unified training ( 580.0 +/- 10 meters vs. 633.3 +/- 5.77 meters,  $p = 0.001$ ).

### **Interpretation of results for Social Inclusion Assessment Questionnaires**

Table 3 presents the comparison of the answers to the questionnaire for evaluating the level of social inclusion before and after training, applied to students from the School Center for Inclusive Education No. 2 in Târgu Mureș. After analyzing the results, in "Question 3: What impact do you think the meeting with the children of the Unirea gymnasium will have on you? How do you think you will feel, what do you think will be your first reaction?" After the test of comparing the answers before and after training, we obtained a significantly different results. Namely to the questionnaire applied before: only 16.7% of the children stated that they will feel included, in the final questionnaire the proportion changed to 66.7%; also to the questionnaire applied before 16.7% of the children stated that they will feel scared by the interaction with other children, this proportion being maintained at

the final questionnaire. Also, a percentage of 33.3% do not know how they will feel / what will be their first reaction to the meeting with the other children at the initial questionnaire, this changing at the final questionnaire, children becoming more confident,  $p = 0.04$ .

*Table 3. Comparison of the answers to the questionnaire before and after training - School Center for Inclusive Education No. 2 in Târgu Mureș*

Questions		Before	%	After	%	Test/p
Q1	Yes	3	50.0	5	83.3	0.65
	Not	3	50.0	0	0.0	
	I do not know	0	0.0	1	16.7	
Q2	Yes	1	16.7	5	83.3	0.17
	Not	5	83.3	0	0.0	
	I do not know	0	0.0	1	16.7	
Q3	I will feel included	1	16.7	4	66.7	<b>0.04</b>
	I will be reluctant	0	0.0	0	0.0	
	I will be scared	1	16.7	1	16.7	
	I will have no reaction	2	33.3	1	16.7	
	I do not know	2	33.3	0	0.0	
Q4	Easy	0	0.0	1	16.7	0.35
	Hard	2	33.3	0	0.0	
	Applicant	0	0.0	2	33.3	
	Acceptable	1	16.7	3	50.0	
	I do not know	3	50.0	0	0.0	
Q5	They will play very well	3	50.0	4	66.7	0.49
	They will play acceptable	1	16.7	1	16.7	
	We won't be able to sync	0	0.0	0	0.0	
	I don't think they will play very well	0	0.0	0	0.0	
	I do not know	2	33.3	1	16.7	
Q6	Yes	5	83.3	6	100.0	0.29
	Not	1	16.7	0	0.0	
	Little bit	0	0.0	0	0.0	
	I do not know	0	0.0	0	0.0	
Q7	Yes	1	16.7	2	33.3	0.75
	Not	2	33.3	2	33.3	
	I do not know	3	50.0	1	16.7	
	Slightly better	0	0.0	1	16.7	
Q8	They will feel good	2	33.3	6	100.0	<b>0.04</b>
	They will not feel well	0	0.0	0	0.0	
	I do not know	4	66.7	0	0.0	

*Question 8: Before this experience, how do you think the children of Unirea Gymnasium will feel?*

A share of 66.7% expressed insecurity before training stating that they do not know how other children will feel when interacting with them, and 33.3% said they will feel good.

And at the final questioning, all 6 children stated that they think that the other students from the National College "Unirea" felt good at the training and unified football games they played together,  $p = 0.04$ .

Table 4. Comparison of the answers to the questionnaire before and after training - "Unirea" National Gymnasium

Questions		Before	%	After n	%	Test/p
Q1	Yes	4	66.7	6	100.0	0.12
	Not	2	33.3	0	0.0	
	I do not know	0	0.0	0	0.0	
Q2	Yes	2	33.3	5	83.3	0.37
	Not	4	66.7	0	0.0	
	I do not know	0	0.0	1	16.7	
Q3	I will feel empathy	2	33.3	1	16.7	0.31
	I will feel ashamed	0	0.0	0	0.0	
	I will be reluctant	1	16.7	0	0.0	
	I will be scared	0	0.0	0	0.0	
	I will have no reaction	3	50.0	5	83.3	
	I do not know	0	0.0	0	0.0	
Q4	Easy	4	66.7	3	50.0	0.71
	Hard	0	0.0	0	0.0	
	Applicant	0	0.0	0	0.0	
	Acceptable	1	16.7	3	50.0	
	I do not know	1	16.7	0	0.0	
Q5	They will play very well	2	33.3	4	66.7	0.1
	They will play acceptable	2	33.3	2	33.3	
	We won't be able to sync	0	0.0	0	0.0	
	I don't think they will play very well	0	0.0	0	0.0	
	I do not know	2	33.3	0	0.0	
Q6	Normal, it won't be anything	5	83.3	6	100.0	0.29
	I'm skeptical about this interaction	1	16.7	0	0.0	
	I don't know if I'll be able to get along	0	0.0	0	0.0	
Q7	Yes	0	0.0	0	0.0	<b>0.03</b>
	Not	0	0.0	3	50.0	
	Little bit	2	33.3	2	33.3	
	I do not know	4	66.7	1	16.7	
Q8	Yes	0	0.0	0	0.0	0.12
	Not	4	66.7	6	100.0	
	I do not know	2	33.3	0	0.0	
Q9	Yes	4	66.7	2	33.3	0.34
	Not	0	0.0	0	0.0	
	Slightly better	1	16.7	3	50.0	
	I do not know	1	16.7	1	16.7	
Q10	They will feel good	4	66.7	2	33.3	0.9
	They will feel ashamed	0	0.0	0	0.0	
	They will feel that they belong to the	0	0.0	4	66.7	
	They will not feel included / accepted	0	0.0	0	0.0	
	I do not know	2	33.3	0	0.0	

## **Discussion and Conclusion**

The results recorded by students with special needs participating in the our research show a statistically significant development of aerobic fitness. The results of the present research being very similar with the results highlighted in other similar studies [15, 16].

The methods and means implemented in the process of preparing the group of students with special needs that make up the representative football team have proven to be effective. We believe that these methods and means can be enriched and improved.

In studies conducted Weiss J and Klein T, it was reported that children with special needs participating in Special Olympics showed high self-esteem, high social adjustment, visibly high physical competence and peer acceptance compared to non-participating children [17, 18].

Regarding the level of social inclusion of children with disabilities, our results indicate that although before the start of training for the unified football championship, both groups of students both those from the National Gymnasium "Unirea" and students with special needs, felt in uncertainty, and they had more negative opinions about the interaction they will have during training, instead in the final testing / questioning we identified significant differences, both groups of students significantly changing their opinion about their peers. They manifest feelings of social inclusion, empathy, well-being and the absence of difference (non-difference), our results confirming the findings of authors Kelly L, and Addams D, in the studies published 2011 and 2017 [5, 19].

Moreover, the results obtained in the present research reinforce the results obtained by Dykens EM in his research which concluded that participating in sports improves the psychological well-being of children with disabilities by providing opportunities to form friendships, express their creativity, and develop a self-identity [20].

The study conducted by Murphy N. [21], et al published in 2008 shows that the psychosocial consequences of physical inactivity include decreased self-esteem, decreased social acceptance, and ultimately a greater dependence on others for daily life. Also, this study emphasizes that the participation of children with disabilities in sports and physical activities can reduce the complications of immobility.

Following the analysis of the results we can say that the hypotheses of the study, the capacity of aerobic fitness can be significantly developed by the unified football game method and the level of social inclusion of children with special needs can be significantly improved by the unified football game method, were confirmed.

We also consider it beneficial to create a permanent program that promotes the exchange of experience and interaction between students with disabilities and students without disabilities in the

training process because through current research we have identified that the effects are significantly positive.

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