TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 29, 2022

A new decade for social changes

ISSN 2668-7798

www.techniumscience.com

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

Increasing the relevance of records on motor development through specialized software

Gabriela Tomescu

National University of Physical Education and Sport, Faculty of Physical Education and Sport, Bucharest, Romania
tomescu.gabriela03@yahoo.com

Monica-Iulia Stănescu

National University of Physical Education and Sport, Faculty of Physical Education and Sport, Bucharest, Romania
monica_iulia@yahoo.com

Kamer-Ainur Aivaz

Ovidius University of Constanta, Faculty of Economics, Romania
aivaz_kamer@yahoo.com

Abstract. Leisure motor activities are not a constant in the educational program of institutionalized children. In the context of several specialized studies suggesting that those who are raised in foster care have a slower or poorer physical development compared to those who grow up with their family, we have conducted a comparative study between a group of institutionalized children and a group of dancers, through which the level of motor development of the two categories could be established objectively. Given that dancesport is not yet used as a means of development and social integration for the children in orphanages, the purpose of this subject is to highlight the contribution of dancing to the psychomotor development of preadolescents. The results of the initial testing with the Optojump device indicate the effectiveness of dancesport in children from families. Thus, an intervention model was developed based on contents of dancesport, in order to stimulate the motor skills of institutionalized children. At the end of the research, significant differences were identified between the initial phase results and the final testing results.

Keywords. Dancesport, motor development, institutionalized children, OPTOJUMP

1. Introduction

Research in the field of neuroscience demonstrates that early biological and psychosocial experiences affect the development of the brain, preventing the achievement of the physical and psychological development potential of the children. Institutionalization results in inequality of opportunities in society, with risk factors including growth delay, attachment and attention disorders, poor health, poor cognitive function, unstable behavior,

and anxiety (Walker S. P. et. al., 2011). Young people are influenced by the cultural, social, and family environment, and the normal development of children depends on the biological system, the positive or negative emotions and the protection factors they have in the first years of their life. Their intensity affects each person differently, depending on their age, the extent of the risk or of the event, as well as their temperament. Certain intervention programs or activities can protect institutionalized children from certain negative consequences and can contribute to a harmonious physical development, comparable to that of children from organized families (Engle P. L. et. al., 2011). The state becomes responsible for the upbringing and development of the institutionalized child and must provide support in order for the child to benefit from the rights that any other person has: education, health, proper nutrition, emotional and behavioral development, rehabilitation, reintegration, communication, safety, self - confidence and trust in the people around him/her (Esponda et. al., 2015).

A study on the metacognition applied in physical education to children aged between 11 and 15 reports that young people who are involved in activities outside of school and who are practicing leisure sports activities get better results in physical education classes (Settanni M. et al., 2012). Metacognition involves awareness of one's own cognitive skills and it develops in relation to various areas of learning (mathematical, linguistic, emotional, physical). Moreover, it suggests the highest level that a person can achieve in terms of emotional and cognitive and mental functions self-control, acquired knowledge and learned strategies. The way a person expresses his/her physical movements and performs certain motor tasks depends on his/her ability to concentrate, his/her attention and self-control. Children who respond to various daily demands have a higher level of development than those who are not provided with guidance in order to stimulate the various types of intelligence.

Regular physical activity is considered by specialists to be an important factor in maintaining optimal health, reducing fatigue and improving the mental state, and it contributes to the process of transformation and development of the child, as well as his/her integration into society. A harmonious development of the personality is influenced by motor, biological, functional, psychological and moral skills (Dragnea A. et. al., 2006). Among the types of leisure activities, we are mentioning dancing, which involves the synchronization of the steps with the music and the development of motor skills. Thus, the cerebral activity is stimulated, attention being constantly needed in order to learn the movements, and memory for composing the choreographies. People who practice this sport have noticed positive changes in terms of their balance, postural stability, flexibility and reaction speed (Douka S. et. al., 2019).

Leisure motor activities are not a constant in the educational program of institutionalized children. In the context in which several specialized studies suggest that those who are raised in foster care have a slower or poorer physical development compared to those who grow up with their family, we have conducted a comparative study between a group of institutionalized children and a group of dancers, through which the level of motor development of the two categories could be established objectively.

2. Literature review

Dancing develops motor skills, coordination, rhythmicity, and spatio-temporal orientation (Zahiu M. et. al., 2020). The association of dance with the physical and mental development of institutionalized children has been studied by several specialists, who have come to the conclusion that art and movement are activities which benefit children with

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

various motor or cognitive impairments. The lack of extracurricular activities and parental attention affect a child's development, as stated by Jones D. E., Greenberg M. and Crowley M. (2015) in a research which highlighted the importance of children's relationships with the adults in the former's education and psychological and cognitive development. Therefore, many institutionalized children have a poor physical and physiological development.

The effectiveness of dancing in children's lives was demonstrated, with improvements noticed both in terms of body and in terms of biology. Pedometric measurements were made, the effects on the heart rate were analyzed, and the evolution of the body mass index was recorded in a study conducted by Lipman T. (2012). This study included 38 children (12 girls and 22 boys), aged between 4 and 12 years, for a period of four weeks. The program included *Streetdance* training, with a 30-minute dance being taught each week. On average, the number of steps taken by children during training days was 1,760 (increasing with each day of activity), and on the days without dancing, 851 steps, with children aged betwwn 8 and 10 registering the highest number of steps compared to other categories, especially the boys (37.2% more than the girls). Also, the resting heart rate increased compared to the initial period.

A similar study was conducted at a school in New York City, with 64 4th and 5th grader participants receiving an after-school dance program based on free-style dancing in the *Mambo, Chacha, Hip-Hop* and *Swing* styles, and courses promoting a healthy lifestyle, for 16 weeks, 50 minutes per day. At the end, positive changes were observed in terms of body composition, endurance, biological aspects - heart rate and risk of developing diabetes (Hogg J. et. al., 2012).

3. Research Methodology

This study involved 54 children aged between 11 and 12, of whom 29 were children from foster care and 25 were dancers from organized families, who are constantly training twice a week. Institutionalized children do not participate in extracurricular physical activities outside of physical education classes. The testing was performed between May 10 and May 16, 2021 and, starting from this preliminary research, we have continued the study of institutionalized children. Thus, we have developed a dance program, which took place over a three-month period (June, 1 – September 1, 2021), with two lessons per week, each lasting 60 minutes. The main methods used combine *art therapy techniques*, such as stimulation through music, movement and play through theatrical art, which contributed to the development of the subjects' psychomotor skills.

In order to conduct this research, we have used the *Optojump battery of tests* so as to assess the motor skills of the subjects, these tests being appreciated by researchers for their efficiency in establishing accurate physical results (Muehlbauer T. et. al., 2017). They represent an innovative measurement system through which the evolution and development of athletes can be observed, with the purpose of optimizing their performance, based on accurate and objective results (Pelin R. A., et. al., 2014).

Optojump is a measuring system consisting of a transmitting and a receiving bar, which detects any interruption in communication between the two devices, calculating its duration. This device can measure the flight and contact times during a series of steps or jumps, with an accuracy of 1/1000 of a second, obtaining a maximum and real-time accuracy of the sportsperson's performance. The device works on the basis of a software which stores the data and the results of the subjects, which makes it possible to observe their evolution and to compare the results of the same person, in the different periods of testing.

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

This system contains several tests which can be administered in order to assess the physical condition of the subjects, in which several factors can be tracked. Within this study, the following tests were administered:

- *15 Sec Jumps* – it involves jumping on the spot, on both legs, for 15 seconds, and it evaluates the power of the lower limbs, recording the flight time of each jump, the contact time, the height and power of the lower limbs;
- *5 Jumps Single Leg Left Left/Right* – it means 5 jumps left / right only on the left leg; through this test one can observe the power and height of the jumps for one leg;
- *5 Jumps Single Leg Right Left/Right* – it means 5 jumps left / right only on the right leg; through this test one can see the power and height of the jumps for one leg;
- *Acoustic/Visual Reaction* – it assesses the reaction speed of the subject, who must react with a jump as soon as possible after receiving acoustic and visual stimuli;
- *March in Place Eyes Closed 30 Seconds* – it involves walking on the spot with one's eyes closed for 30 seconds and it records the number of steps and the surface travelled during the test from the starting position; thus, the spatial orientation of the subject can be observed;
- *Speed Reps* – it measures the sportsperson's repetition speed. He/she must run on the spot for 10 seconds, with a maximum frequency of the steps, the power and the number of steps being observed.

The analysis and interpretation of the results have been performed with the help of the statistical indicators *chi-square* (X^2) and *Phi* (Pearson's coefficient). The first part of the research has explored the differences in terms of the test results between institutionalized children and dancing children from organized families. In the second part of the research, the differences between the initial and the final results of the institutionalized children have been identified, after undergoing the dance program.

4. Results and Discussion

Table 1 shows the results recorded by the children in each group: cc (foster care children) and d (dancers) for the following tests: 15 sec jumps, 5 jumps single leg Right left/right, 5 jumps single leg Left left/right, Acoustic/visual reaction, March in place eyes closed 30 seconds, Speed reps.

Table 1. The statistical description of results – the initial testing

Category	cc			d			Total		
	Mean	N	STD	**Mean**	N	STD	Mean	N	STD
15 Jumps TCont. [s]	**0,21**	29	0,05	**0,28**	25	0,07	0,24	54	0,07
15 Jumps Tflight [s]	**0,19**	29	0,11	**0,32**	25	0,08	0,25	54	0,12
15 Jumps Height [cm]	**5,46**	29	2,65	**13,83**	25	6,14	9,33	54	6,2
15 jumps Power [W/Kg]	**9,25**	29	4,46	**20,28**	25	8,18	14,35	54	8,46
5 jumps Right leg Height [cm]	**4,85**	29	1,23	**7,74**	25	3,9	6,19	54	3,13

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

5 jumps Right leg Power [W/Kg]	**1,95**	29	0,4	**3**	25	3,12	2,43	54	2,18
5 jumps Left leg Height [cm]	**4,04**	29	1,3	**7,16**	25	2,8	5,49	54	2,63
5 jumps Left leg Power [W/kg]	**1,95**	29	0,55	**2,68**	25	2,22	2,28	54	1,59
Ac_vis Time React [s]	**0,97**	29	0,34	**0,71**	25	0,16	0,85	54	0,3
March eyes closed Nsteps	**34,41**	29	9,08	**34,92**	25	4,96	34,64	54	7,4
March Eyes closed Jumping Point [cm]	**167,07**	29	55,5	**94,61**	25	46,54	133,53	54	62,75
Speed reps Nsteps	**21,37**	29	5,47	**30,6**	25	5,77	25,64	54	7,24
Speed reps Power [W/Kg]	**0,2**	29	0,19	**0,51**	25	0,93	0,34	54	0,66

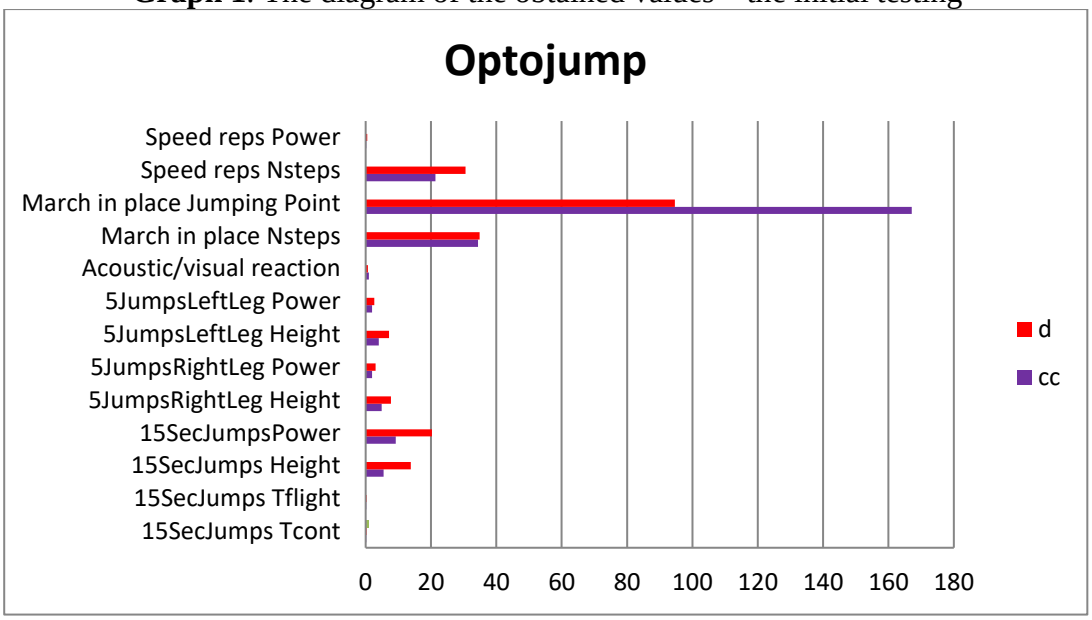
The children's results, bolded in Table 1, show that, in all the tests, the dancers obtained better results, however the ones that stood out the most were those that focused on the height of the jumps and the power of the lower limbs. In the *15sec. jumps* test, institutionalized children have an average jump height of 5.46 cm, compared to the dancers, whose level is 13.83 cm, and the average *jump power on both legs* is 9.25 W/Kg, respectively 20.28.

A positive aspect regarding the group of children in foster care is that the coordination level of the lower limbs is relatively similar, the laterality of these children being visible in the mean value obtained in the *5 jumps single leg left / right* tests, where the height and power of jumps on both lower limbs have similar values (4.85 cm height and 1.95 W / Kg power for the right leg, respectively 4.04 cm height and 1.95 W / Kg power for the left leg).

Graph 1 shows the fact that dancers are better prepared physically than institutionalized children, the average results indicating better values in the case of the sportspersons.

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

Graph 1. The diagram of the obtained values – the initial testing



The March in place closed eyes 30 seconds test suggests an almost equal result in terms of the number of steps taken in half a minute with the eyes closed, but the point of contact on the ground is significantly higher for the foster care children, their deviation being 167.07 cm compared to 94.61 for the dancers. The difference in terms of the number of steps taken is noticed in the *Speed reps* test, where the dancers took, on average, in ten seconds, 30.6 steps running on the spot, while the institutionalized children took only 21.37.

Table 2. Chi-Square analysis from the initial testing

Tests	Chi-Square	p	Phi
15 sec jumps			
TCont.[s]	41.93	0.56	0.88
TFlight[s]	51.98	0.35	0.98
Height[cm]	47.96	0.24	0.94
Power[W/Kg]	54	0.36	1
5 jumps single leg Right left/right			
Height[cm]	51.98	0.43	0.98
Power[W/Kg]	47.96	0.21	0.94
5 jumps single leg Left left/right			
Height[cm]	54	0.32	1
Power[W/Kg]	47.29	0.37	0.93
Acoustic/visual reaction			
Time Reaction [s]	51.31	0.38	70.74
March in place eyes closed 30 seconds			
Nsteps	27.32	0.16	0.71
Jumping Point[cm]	54	0.28	1

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

Speed reps			
Nsteps	41.46	**0.01**	0.87
Power[W/Kg]	46.28	0.46	0.91

Calculating the *Chi-Square*, *p* and *Phi* statistics, it can be seen that although the test results indicate a better level of physical training for the dancers than for the institutionalized children, there are no significant differences between these two groups. Since $p < 0.05$ is necessary so that the differences between the two groups can be obvious, only the number of steps taken in the *Speed reps* test, where χ^2 (3) = 41.46 and $p < 0.01$ indicate the existence of significant differences between the two analyzed groups.

In the second part of the testing, only the 29 children from foster care participated. A three-month dance program was applied to this sample, which involved learning *Standard* and *Latino* steps in dancesport. The purpose of these trainings is to improve the motor skills and the coordination skills of institutionalized children.

The complexity of dancing is very high, which allows for it to be practiced in various ways, regardless of the level of physical and intellectual training of the subjects. The variety of styles streamlines the development of motor skills and can ensure the children's interest maintained throughout the study.

The training for this program is adapted to the children's level of preparation. The ending of the study is marked by the final testing of the participants, in order to establish to what extent the institutionalized children have evolved physically, three months since the beginning of the study (T0).

The results showed improvements in almost all the sports tests applied through the Optojump device. The flight time, the height and the power of the jumps in the *15sec jumps* test were highlighted, as well as the height of the jumps on the right leg at *5 Jumps Single Leg Right Left / Right* (T0 = 4.85, compared to T1 = 7.35). Not only the power was developed after three months of training, but also the reaction speed, as the reaction time in the *Acoustic / Visual Reaction* test decreased from 0.97 to 0.70. However, the speed of repetition did not improve, on the contrary, the number of steps taken in 10 seconds (*Speed Reps*) increased from 21.37 to 24.24.

Table 3. The statistical description of the results – the final testing

Paired Samples Statistics					
		Mean	N	STD	STD Mean
1	15sec jumps_TCont.[s] T0	0.21	29	0.05	0.009
	15sec jumps_TCont.[s] T1	0.25	29	0.07	0.01
2	15sec jumps_TFlight[s] T0	0.19	29	0.11	0.02
	15sec jumps_TFlight[s] T1	**0.36**	29	0.58	0.1
3	15sec jumps_Height[cm] T0	5.46	29	2.65	0.49
	15sec jumps_Height[cm] T1	**8.89**	29	4.01	0.74
4	15sec jumps_Power[W/Kg] T0	9.25	29	4.46	0.82
	15sec_jumps_Power[W/Kg] T1	**13.2**	29	6.13	1.13
5	5 jumps R l_Height[cm] T0	4.85	29	1.23	0.22
	5 jumps R l_Height[cm] T1	**7.35**	29	5.76	1.07

TECHNIUM SOCIAL SCIENCES JOURNAL

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

6	5 jumps Right l_Power[W/Kg] T0	1.95	29	0.4	0.07
	5 jumps Rightl_Power[W/Kg] T1	2.18	29	0.46	0.08
7	5 jumps Left l_Height[cm] T0	4.04	29	1.3	0.24
	5 jumps Left l_Height[cm] T1	4.97	29	1.51	0.28
8	5 jumps Left l_Power[W/Kg] T0	1.95	29	0.55	0.1
	5 jumps Left l_Power[W/Kg] T1	2.23	29	0.49	0.09
9	Acoustic_visual_Time Reaction [s] T0	0.97	29	0.34	0.06
	Acoustic_visual_Time Reaction [s] T1	0.7	29	0.23	0.04
10	March_eyes closed_Nsteps T0	34.41	29	9.08	1.68
	March_eyes closed_Nsteps T1	35.27	29	8.72	1.62
11	March_eyes closed_Jumping Point[cm] T0	167.07	29	55.5	10.3
	March_eyes closed_Jumping Point[cm] T1	143.84	29	51.34	9.53
12	Speed_reps_Nsteps T0	21.37	29	5.47	1.01
	Speed_reps_Nsteps T1	**24.24**	29	5.87	1.09
13	Speed_reps_Power[W/Kg] T0	0.2	29	0.19	0.03
	Speed_reps_Power[W/Kg] T1	0.28	29	0.2	0.03

The results obtained in the final testing were compared with the initial ones with the help of statistical methods (Pearson correlation coefficient and Test t), which indicate to what extent the connections between the two moments of the testing are significant.

Table 4. Pearson correlation coefficient

Paired Samples Correlations				
		N	Correlation	Sig.
1	15 sec jumps_TCont.[s] T0 & 15 sec jumps_TCont.[s] T1	29	0.69	0.000
2	15 sec jumps_TFlight[s] T0 & 15 sec jumps_TFlight[s] T1	29	**0.84**	0.000
3	15 sec jumps_Height[cm] T0 & 15 sec jumps_Height[cm] T1	29	**0.7**	0.000
4	15 sec jumps_Power[W/Kg] T0 & 15 sec jumps_Power[W/Kg] T1	29	0.77	0.000
5	5 jumps Right l_Height[cm] T0 & 5 jumps Right l_Height[cm] T1	29	-0.06	**0.750**
6	5 jumps Right l_Power[W/Kg] T0 & 5 jumps Right l_Power[W/Kg] T1	29	0.68	0.000
7	5 jumps Left l_Height[cm] T0 & 5 jumps Left l_Height[cm] T1	29	0.63	0.000

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

8	5 jumps Left l_Power[W/Kg] T0 & 5 jumps Left l_Power[W/Kg] T1	29	0.57	0.001
9	Acoustic_visual_Time Reaction [s] T0 & Acoustic_visual_Time Reaction [s] T1	29	0.65	0.000
10	March_eyes closed_Nsteps T0 & March_eyes closed_Nsteps T1	29	**0.96**	0.000
11	March_eyes closed_Jumping Point[cm] T0 & March_eyes closed_Jumping Point[cm] T1	29	**0.71**	0.000
12	Speed_reps_Nsteps T0 & Speed_reps_Nsteps T1	29	**0.89**	0.000
13	Speed_reps_Power[W/Kg] T0 & Speed_reps_Power[W/Kg] T1	29	**0.87**	0.000

The correlation between two categories is important if it exceeds the value of 0.7, the strongest being for the number of steps taken in the *March in place closed eyes 30 sec* (0.96) and *Speed Reps* (0.89) tests. The values of *Sig*. are less than 0.05, which indicates significant differences in almost all the compared items, except for the height obtained in the right foot jumps in the *5 jumps single leg Right left / right* test, where *Sig*. = 0.75 and the value of the Pearson correlation coefficient is negative (-0.06).

Table 5. The t Test results - the final testing

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
	Category	Mean	Std. Dev.	Std. Error Mean	Lower	Upper			
1	15 sec jumps_TCont.[s] T0 - 15 sec jumps_TCont.[s] T1	-0.04	0.05	0.01	-0.06	-0.02	-4.69	28	0.000
2	15 sec jumps_TFlight[s] T0 - 15 sec jumps_TFlight[s] T1	-0.17	0.49	0.09	-0.35	0.01	-1.86	28	0.072
3	15 sec jumps_Height[cm] T0 - 15 sec jumps_Height[cm] T1	-3.43	2.86	0.53	-4.52	-2.34	-6.44	28	0.000
4	15 sec jumps_Power[W/Kg] T0 - 15 sec jumps_Power[W/Kg] T1	-3.95	3.85	0.71	-5.42	-2.48	-5.51	28	0.000
5	5 jumps Right l_Height[cm] T0 - 5 jumps Right _Height[cm] T1	-2.50	5.97	1.1	-4.77	-0.23	-2.25	28	0.032
6	15sec_rl_Power[W/Kg] T0 - 15sec_rl_Power[W/Kg] T1	-0.23	0.35	0.06	-0.36	-0.09	-3.54	28	0.001

Technium Social Sciences Journal
Vol. 29, 42-53, March, 2022
ISSN: 2668-7798
www.techniumscience.com

7	5 jumps Left l_Height[cm] T0 - 5 jumps Left l_Height[cm] T1	-0.93	1.21	0.22	-1.39	-0.47	-4.12	28	0.000
8	5 jumps Left l_Power[W/Kg] T0 - 5 jumps Left l_Power[W/Kg] T1	-0.28	0.48	0.08	-0.47	-0.10	-3.20	28	0.003
9	Acoustic_visual_Time Reaction [s] T0 - Acoustic_visual_Time Reaction [s] T1	0.266	0.26	0.04	0.16	0.36	5.52	28	0.000
10	March_eyes closed_Nsteps T0 - March_eyes closed_Nsteps T1	-0.86	2.47	0.45	-1.8	0.07	-1.87	28	0.071
11	March_eyes closed_Jumping Point[cm] T0 - March_eyes closed_Jumping Point[cm] T1	23.23	40.89	7.59	7.68	38.79	3.06	28	0.005
12	Speed_reps_Nsteps T0 - Speed_reps_Nsteps T1	-2.86	2.6	0.48	-3.85	-1.87	-5.92	28	0.000
13	Speed_reps_Power[W/Kg] T0 - Speed_reps_Power[W/Kg] T1	-0.08	0.1	0.01	-0.12	-0.04	-4.66	28	0.000

The *t test* for paired samples marks the presence of significant differences between the group of institutionalized children at the initial moment and at the time recorded after three months of constant dancesport training. The tests in which there were no obvious differences recorded are *15 sec jumps – Time Flight* (t = -1.86; Sig = 0.072) and *March in place eyes closed 30 sec – N Steps* (t = -1.87; Sig = 0.071). All the other variables show significant differences, the Sig. value being much less than 0.05, which means that the evolution from a physical point of view of the children who took part in this study is obvious.

These measurements indicate that the motor skills and coordination skills of institutionalized children were developed after only three months of study, with the statistical methods showing that there were obvious improvements from a physical point of view and that the dance program is effective.

5. Conclusions

As a result of the undertaken research, differences were noticed between the two analyzed groups. The administered tests are not specific to the dancers' training and assessments, the Optojump device being used for the first time on the group of dancers who took part in this study. However, children who come from organized families and who dance regularly have better developed physical qualities than institutionalized children, with better results obtained in all the tests applied using *Optojump*, mainly in terms of lower limb power.

During the three months of the dance program, the motor performance of institutionalized children improved. There are significant differences between the initial and

the final testing, the results obtained in most of the administered tests showing remarkable improvements. Thus, we can conclude that the dance program was effective, contributing to the development of motor skills of the children from a disadvantaged environment.

Based on the idea that physical activities outside of school hours improve the quality of life, this study may open new research perspectives on the way dance positively influences the physical development and the integration into society of institutionalized children. Physical activities require socializing and communicating among the participating members and, once they have acquired the ability to perform certain motor tasks, children become self-confident and are accepted by their peers. We believe that dancesport is a complex type of sport that stimulates motor skills and coordination skills, and the results of the tests of the *Optojump* device have confirmed the hypotheses of this research, according to which dancing practiced as a sports activity outside of physical education can improve children's psychomotor development.

References

[1] S. DOUKA, V. I. ZILIDOU, O. LILOU, V. MANOU: Traditional dance improves the physical fitness and well-being of the elderly. *Frontiers in Aging Neuroscience,* DOI:10.3389/fnagi.2019.00075, Vol. 11, 2010.

[2] A. DRAGNEA, A. BOTA, M. STĂNESCU, S. TEODORESCU, S. ȘERBĂNOIU, V. TUDOR: *Theory and didactics of physical education and sports [Teoria și didactica educației fizice și sportului]*, Fest publishing house, Bucharest, 2006.

[3] P. L. ENGLE, L. C. H. FERNALD, H. ALDERMAN, J. BEHRMAN, C. O`GARA, A. YOUSAFZAI, M. CABRAL DE MELLO, M. HIDROBO, N. ULKUER, I. ERTEM, S. ILTUS, And the Global Child Development Steering Group: Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *The Lancet*, DOI:10.1016/S0140-6736(11)60889-1, Vol. 378 October 8, 2011, 378:1339-53.

[4] L. A. ESPONDA, A. SHARMA, S. UPADHYAY, S.: Comparative review on the legal protection provided to institutionalised children in the South Asian region. *Institutionalised Children Exploration and Beyond*, DOI: 10.5958/2349-3011.2015.00003.1, Vol. 2, Number 1, 2015, pp. 27-54,.

[5] J. HOGG, A. DIAZ, M. DEL CID, C. MUELLER, E. G. LIPMAN, S. CHERUVU, Y. CHIU, M. VOGIATZI, S. NIMKARN, S: An after-school dance and lifestyle education program reduces risk factors for heart disease and diabetes in elementary school children. *Journal of Pediatric Endocrinology and Metabolism*, DOI:10.1515/jpem-2012-0027 (2012).

[6] D. E. JONES, M. GREENBERG, M. CROWLEY: Early social-emotional functioning and public health: the relationship between kindergarten social competence and future wellness. *American Journal of Public Health*, DOI: 10.2105/AJPH.2015.302630, 105(11): e1-e8, 2015.

[7] T. LIPMAN: Dance for health: implementation of a dance program to improve pshysical activity of children. *University of Pennsylvania*, School of Nursing, Philadelphia PA, DOI: 10.1016/j.pedn.2012.03.007, 2012.

[8] T. MUEHLBAUER, J. PABST, U. GRANACHER, D. BUSCH: Validity of the Jump-and-Reach Test in subelite adolescent handball players. *Journal of Strenght and Conditioning Research*, DOI:10.1519/JSC.0000000000001607, Vol. 31, Iss. 5,2017.

[9] R. A. PELIN, M. NETOLITZCHI, I. RACHITA: Analysis and measurement system using Optojump to optimize explosive force at the junior group level of Alpine skiing. *The*

10th International Scientific Conference eLearning and software for Education, 10.12753/2066-026X-14-254, Bucharest 2014.

[10] M. SETTANNI, D. MAISTRO, E. RABAGLIETTI: Development and preliminary validation of an instrument to measure metacognition applied to physical activity during early adolescence. *Cognition, Brain, Behavior. An Interdisciplinary Journal,* ISSN:1224-8398, Vol. XVI, No. 1 March 2012, 67-87.

[11] S. P. WALKER, T. D. WACHS, S. GRANTHAM-McGREGOR, M. M. BLACK, C. A. NELSON, A. L. HUFFMAN, H. BAKER-HENNINGHAM, S. M. CHANG, J. D. HAMADANI, B. LOZOFF, J. M. MEEKS GARDNER, C. A. POWELL, A. RAHMAN, L. RICHTER: Inequality in early childhood: risk and protective factors for early child development. *The Lancet,* 378:1325-38, DOI:10.1016/S0140-6736(11)60555-2, Vol. 378 October 8, 2011.

[12] M. ZAHIU, M. MANOS, G. F. DRĂGHICI: Coordination in formation dancesport at begginer lever. *Discobolul-Physical Education, Sport and Kinetotherapy Journal,* https://doi.org/10.35189/dpeskj.2020.59.3.6, Vol. 59, Issue 3, 271-288, 2020.