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Determining the Changes in Psychomotor Behavior of Adolescents with Special Needs

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Abstract: *The research focuses on the development of physical, cognitive and social components in 28 adolescents (12-14 years old). They are students of two institutionalized centers of Romania. The first one is the "Sfântul Ştelian" Inclusive Education School Center of Costesti, Arges(CC-12 subjects). The second one is the "Sfânta Filofteia" Inclusive Education School Center of Ştefăneşti (CS-16 subjects). This research aims to identify the individual particularities in the psychomotor behavior of adolescents with special needs (SEN). The subjects were included in personalized psychomotricity programs without compromising the effectiveness of these ones. The specific needs of each individual child were taken into consideration. Primary data were obtained by comprehensively analyzing the psychological records of subjects and evaluating their motor development and physical condition. Scientific instruments used: Optojump Next optical system for movement analysis; Witty SEM intelligent semaphore; Sensamove balance miniboard and Tanita body composition analyzer. Finally, the results from the two centers were compared through statistical-mathematical analysis. The Kolmogorov-Smirnov test and, as appropriate, the Independent sample t-test and Mann-Witney U test were used. The results of the psycho-pedagogical records highlighted that the socio-demographic variables had relatively similar characteristics in the two institutionalized centers. Regarding the analysis of the psychomotor component, the comparisons between the groups distributions revealed statistically significant differences in only 18.7%. The combined results showed that psychomotor interventions can be similarly applied in the two centers, using the same program. The intervention program and the experimental results of its application are the subject of another research.*

Keywords: *Psychomotor tests, single program, psychomotor interventions, institutionalized centers, statistical-mathematical analysis.*

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Introduction

Psychomotricity, as a therapeutic and educational approach, is an increasing field of research. It deals with the complex relationship between the mental and motor aspects of the individual (Albu et al., 2006). As shown by Cojanu et al. (2023) and also Aharoni (2005), this concept is an essential intervention tool. It has a significant applicability in the development of motor, cognitive and social skills of children and adolescents. Those with special needs are also included in this category. In the opinion of Bălan (2021), the adapted psychomotricity is a key component of this field. It has the potential to positively influence the life quality of these young people.

Special education in Romania is based on a legislative framework and regulations adapted to European standards. In this context, the necessity of a scientific approach to the adapted psychomotricity for children with special needs is obvious (Sararu, 2023). Although this field has already numerous studies and researches, the scientific and thorough development of these aspects is still necessary. The purpose is contributing to a more efficient and effective framework developed in the education of children with special needs (Gherguţ, 2016).

As Chirazi and Constantin (2020) also pointed out, special education in Romania faces significant challenges. This happens especially in the context of the economic and social changes in the country. Adapted psychomotricity becomes a crucial aspect in this regard. Therefore, the material, financial, energy and human resources are very important to ensure a solid foundation for special education (Bălan, 2021). This research focuses on the impact of the adapted psychomotricity on the children with special educational needs (SEN). The interaction between physical, cognitive and social components of these young persons were taken into consideration. Scientific research is vital for acquiring the knowledge needed to improve the intervention and inclusion tools in special education (Potop et al., 2023). This research can entail various approaches, including experiments (Fleancu, 2007). It also involves descriptive and hermeneutical analysis and qualitative and quantitative research as well (Bratu et al., 2021). It has the potential to reveal the significant correlation between psychomotricity and social inclusion. Thus, it contributes to the development of more effective educational programs.

Psychomotor interventions can bring significant benefits to the motor development of adolescents with SEN. This fact is supported by the scientific research on human performance (Leisure and Cultural Services Department, 2021, Carty et al., 2021, Moşoi & Balint, 2015; Lincă & Matei,

2023; Abalaşei & Trofin, 2016). Adapted psychomotricity is a research and intervention discipline used in the development of motor-cognitive skills of children with special needs (Chirazi & Constantin, 2020). Previous studies (Fotiadou et al., 2017; Grosu, 2009; Kiphard, 2001; Sit et al., 2019; Traina et al., 2022; Zimmer et al., 2008) showed that psychomotor interventions can have a positive impact on these adolescents, compared to no intervention at all. Different approaches to the development of the motor-cognitive skills in SEN adolescents were identified in the specialized literature (Curriculum Development Council, 2017; Edyburn, 2013; Rameckers et al., 2023; Sit et al., 2020, Stancu & Popescu, 2023). Task-oriented approaches focus on functional tasks that require the use of psychomotor skills. As for the process-oriented approaches, they analyze the underlying psychomotor processes. However, according to Muñoz-Lerena et al. (2022), it was suggested that the task-oriented approaches may be more effective. They are closely related to the demands of daily life and provide opportunities to apply motors skills in meaningful contexts.

Also, the effectiveness of motor interventions may depend on various factors The age of the adolescent, the severity of special needs and the individual characteristics are such factors. Therefore, the development of personalized interventions adapted to the needs and abilities of each adolescent becomes a necessity (Horvat et al., 2010; Ikezawa et al., 2023; Pătrăşcan & Ştefănică, 2019; Ion-Ene et al., 2014; Badau et al., 2023). Thus, the current research focuses on analyzing and interpreting the data obtained from the psychomotor tests and psychological reports. The purpose is to design personalized programs of adapted psychomotricity for supporting the holistic development of adolescents with special needs. These programs contribute to the objectives of inclusive education. Psychomotor and body composition assessment correlated with psychological data is fundamental in developing intervention programs for children with special needs.

There are some essential elements necessary for understanding and effectively developing personalized psychomotricity programs. One of them is using Tanita body composition analyzer to assess body composition. Some tools like Optojump Next, Sensamove and Witty SEM are used for assessing psychomotor skills (balance and neural processing speed) (Wang et al., 2018; Leonard, 2016; Rezabala et al., 2020; White & Duffy, 2014).

How the elements above contribute to the development of these programs is shown below:

1. *Assessment of motor development level* – the assessment tools of psychomotor skills such as Optojump Next, Sensamove and Witty SEM allowed to collect quantitative data. These data refer to balance, speed of

neural processing and other aspects related to movement. They provide a clear picture of the motor development level of each child with special needs.

2. *Identifying deficiencies and progress* –the deficiencies in the psychomotor skills of the children were identified by means of the tools mentioned above. It was also identified the possible progress made after the intervention. This information is a guide in the development of more effective strategies of intervention.

3. *Assessment of physical condition* - the Tanita body composition analyzer provides data on the body composition of children with special needs. Thus, the fat mass, fat free mass, body mass index and metabolic age can be determined. This information is crucial for understanding the physical state of the children and helps developing proper programs of intervention.

4. *Personalization of psychomotricity programs* – if individual data are available for each child, it is possible to develop personalized psychomotricity programs. These programs are tailored to the needs and specific skills of each child. This fact ensures a more effective and relevant intervention.

5. *Profile-based grouping* –children with special needs can be grouped according to their profile, using individual data. This allows the development of homogeneous work groups. The psychomotricity programs are adapted to the development level and specific needs of each group. Grouping can maximize the effectiveness of intervention programs and can create an appropriate learning environment for each child.

This research mainly aims to investigate how to implement a grouping approach allowing the development of a common psychomotricity program. The effectiveness of this program will not be affected regarding the specific needs of each child in the group.

This issue is essential for developing adapted psychomotricity programs, considering the variability of individual capacities and needs of SEN children. This scientific approach aims to increase the effectiveness of inclusive education and ensures an individualized strategy for all SEN children.

The research objectives include:

- Analyzing the psychological records of the subjects;
- Assessing the level of motor development and physical condition;
- Comparing the subjects from the two centers through statistical-mathematical analysis;
- Establishing whether the same program or different programs must be used in the two centers.

Purpose of the research

The main purpose of this research was to identify the individual changes in the psychomotor behavior of special needs adolescents. These adolescents are students of two institutionalized school centers. It was possible to group the subjects in personalized programs of psychomotricity. This was done without compromising the effectiveness of the programs in terms of specific needs of each individual child.

Material and methods

Subjects

The research was conducted in two Inclusive Education School Centers. The first center was the „Sfantul Stelian", Costesti, Arges (CC) and the second one was the „Sfanta Filofteia", Stefanesti (CS). The subjects of the research were 28 children with special educational needs (SEN), aged from 12 to14 years. A number of 12 subjects were students of CC and 16 subjects of CS. The consent of the parents was required and signed before starting the research according to the Declaration of Helsinki. It was approved by the Ethics Committee of the Doctoral School of Physical Education and Sport Science (ID: 04/21.07.2023), University of Pitesti, Romania.

Methods

In the first stage (September 2022), the psychological records of the subjects were analyzed. The records were filled in by the psychologists of the institutional centers for each individual subject, throughout the institutionalization period.

In the second stage (October 2022), the subjects went through a series of tests meant to provide specific information. The tests focused on the manifestation of some components in the sphere of psychomotricity, motors skills and also body composition. The tests were carried out using special equipment, devices and the associated software modules. These ones allowed to record, process and centralize the data for each subject separately. Thus, the Sensamove balance miniboard was used to assess static coordination. Perceptual motor coordination capacity and the explosive force level were identified through the Optojump Next optical system for motion analysis. The speed of movements was measured by means of the Witty SEM Intelligent semaphores. The Tanita body composition analyzer was used to determine the body composition.

The *statistical- mathematical analysis* aimed to compare the results of the two research groups. The objective is to find out how to ensure the improvement of the psychomotor condition of the subjects. Namely, to decide if a single common program or two different programs must be used in the two centers. First the distributions normality was verified using Kolmogorov-Smirnov Test in order to establish the appropriate test of comparison between groups. Then, depending on its results, it was used as appropriate the Independent sample t-test or the Mann-Whitney U Test. The Independent sample t-test was used whenever both distributions turned out to be normal. The Mann-Whitney U Test was applied whenever one or both distributions turned out to be abnormal.

Results

Tables 1 and 2 present the results of the descriptive analysis carried out by analyzing the socio-demographic variables. These ones are listed in the psychological records of the subjects, per centers (Table 1-CS; Table 2-CC)

Table 1. Socio-demographic profile of the research subjects – School of Inclusive Education „Sfânta Filofteia" Stefăneşti, Arges

Socio-demographic variables	**Frequency**	**Percent**	
Gender			
Male	11	66.66%	
Female	5	33.33%	
Psychomotor variables	**According to age, formed body schema, established laterality**	**Perceptual distortion of time, space, shape; body schema in formation progress**	
	11(66.66%)	5 (33.33%)	
Cognitive variables	**Simple**	**Complex**	**No**
Understands concepts	14 (87.5%)	2 (12.5%)	-
Defines concepts	15 (93.75%)		1 (6.25%)
Operates with concepts	14 (87. 5%)	1 (6.25%)	1

Language and communication	**Reduced**	**Medium developed**	**Developed**	
Vocabulary	2 (12.5%)	13 (81.25%)	1 (6.25%)	
Oral expression	9 (56.25%)	1 (6.25%)	6 (37.5%)	
Attention	**Attention disorders**	**Does not have attention disorders**		
	14 (87.5%)	2 (12.5%)		
Social variables	**Stable, communicative**	**Withdrawn, isolated**	**Turbulent, violent**	
	12 (75%)	4 (25%)	7 (43.75%)	
Level of school knowledge	**Total of absences from school**	**poor**	**good**	**Very good**
Reading skills	2 (12.5%)	11 (66.6%)	3 (18.75%)	
Writing skills	1 (6.25%)	12 (75%)	2 (12.5%)	1 (6.25%)
Calculation skills	2 (12.5%)	12 (75%)	1 (6.25%)	1 (6.25%)

Table 2. Socio-demographic profile of the research subjects – School of Inclusive Education „Sfantul Stelian" Costesti, Arges

Socio-demographic variables	**Frequency**	**Percent**		
Gender				
Male	7	58.33%		
Female	5	41.67%		
Psychomotor variables	**According to age, formed body schema, established laterality**	**Perceptual distortion of time, space, shape; body schema in formation progress**		
	4 (33.34%)	8 (66.66%)		
Cognitive variables	**Simple**	**Complex**	**No**	
Understands concepts	12 (100%)	-	-	
Defines concepts	8 (66.66%)		4 (33.34%)	
Operates with concepts	10 (83.33%)		2 (16.67%)	
Language and communication	**Reduced**	**Medium developed**	**Developed**	
Vocabulary	4 (33.34%)	8 (66.66%)	-	
Oral expression	9 (75%)	3 (25%)	-	
Attention	**Attention disorders**	**Does not have attention disorders**		
	12 (100%)	-		
Social variables	**Stable, communicative**	**Withdrawn, isolated**	**Turbulent, violent**	
	8 (66.66%)	4 (33.34%)	3 (25%)	
Level of school knowledge	**Total of absences from school**	**poor**	**good**	**very good**
Reading skills	3 (25%)	7 (58.33%)	2 (16.67%)	
Writing skills	2 (16.67%)	8 (66.66%)	2 (16.67%)	-
Calculation skills	5 (41.66%)	5 (41.66%)	2 (16.67%)	-

Table 3 shows the results of some tests aiming at both psychomotricity components and motor skills manifestation aspects (explosive force). The psychomotricity components include: static coordination, motor perceptual coordination (perception of space, rhythm and own movements) and speed of movements.

Table 3. Psychomotor profile of the subjects

No.[1]	Static balance (%)	Neural processing speed			Eyes Open dynamic balance		Eyes Closed dynamic balance		Height of the center of mass
		No. of identified stimuli	Time of neural processing (s)	Processing speed (pulse/sec.)	Contact time (ms)		Contact time[2] (ms)		
					Left leg	Right leg	Left leg	Right leg	
1	71	10	28.74	0.35	0.831	0.814	0.8	0.789	23.1
2	60	9	27.32	0.33	0.723	0.73	0.691	0.675	12.9
3	42	9	27.51	0.33	0.693	0.697	0.71	0.722	19.3
4	68	9	28.24	0.32	0.748	0.578	0.826	0.696	9.5
5	35	9	28.69	0.31	0.938	0.904	0.962	0.915	13.3
6	32	9	28.34	0.32	0.847	0.743	0.718	0.726	8.1
7	58	9	29.65	0.30	2.829	1.635	1.131	1.203	4.5
8	18	9	29.84	0.30	0.835	0.872	0.906	0.857	18.3
9	11	9	29.33	0.31	1.82	1.548	2.339	2.448	20.3
10	79	8	29.42	0.27	0.88	0.83	0.694	0.689	14.3
11	83	15	28.41	0.53	0.979	1.04	0.937	0.845	23.7
12	35	15	29.34	0.51	0.714	0.688	0.694	0.67	11.6
13	17	14	29.37	0.48	0.827	0.91	0.92	0.916	13.4
14	69	13	25.19	0.52	0.89	0.922	0.827	0.891	14.4
15	74	15	29.08	0.52	1.421	1.254	1.36	1.361	22.2
16	79	18	28.64	0.63	0.598	1.421	0.828	0.832	22.7
17	86	14	28.92	0.48	0.862	1.295	0.813	0.857	18.8
18	73	18	28.46	0.63	0.691	0.695	0.7	0.704	26.4
19	44	17	29.78	0.57	0.779	0.741	0.735	0.736	32
20	79	18	29.72	0.61	0.799	0.836	0.846	0.874	19.9

21	90	18	29.90	0.60	0.655	0.64	0.996	1.019	44.1
22	55	15	29.21	0.51	0.727	0.761	0.803	0.956	20.1
23	81	17	29.13	0.58	0.648	0.73	0.675	0.765	20.7
24	77	18	29.62	0.61	0.796	0.89	0.716	0.798	17.2
25	76	15	29.18	0.51	0.798	0.722	0.824	1.033	29.6
26	48	15	28.45	0.53	0.938	0.75	0.97	0.794	19.4
27	93	16	28.19	0.57	1.298	1.274	1.328	1.313	16.6
28	66	16	28.33	0.56	0.813	0.848	0.799	0.846	7.1

[1] order numbers 1-12 correspond to CC group - Costesti Center-Arges; order numbers 13-18 correspond to CS group – Center of Stefănesti-Arges; [2] Arithmetic mean of contact time over 20 seconds

Table 4 highlights the results of body analysis performed using the Tanita body composition analyzer. Numbers 1 to 12 represent the subjects of the CC center. The order numbers 13 to 28 represent the subjects of the CS center.

Table 4. Body analysis of the subjects

No [1]	Age (years)	Height (cm)	Weight (kg)	FATP (%)	FATM (kg)	FFM (kg)	BMI	METAAGE (years)
1	14	150	65.3	34	22.2	43.1	29	36
2	14	172	53.9	20.4	11	42.9	18.2	12
3	14	145	33.4	5	1.7	31.7	15.9	12
4	14	150	42	8.9	3.8	38.2	18.7	12
5	12	171	49	5	2.5	46.5	16.8	12
6	14	165	53	14.4	7.6	45.4	19.5	12
7	14	168	69.4	20.3	14.1	55.3	24.6	12
8	12	146	38.2	19.6	7.5	30.7	17.9	12
9	14	155	37.7	5	1.9	35.8	15.7	12
10	13	141	27.1	16.16	4.38	22.72	13.63	27.1
11	13	153	95.7	45.74	43.77	51.93	40.88	33
12	14	162	53.7	24.8	13.3	40.4	20.5	14
13	14	149	33.1	11.13	3.68	29.42	14.91	13
14	14	157	42.2	23.4	9.87	32.33	17.12	16
15	14	155	60.1	29.8	17.9	42.2	25	12
16	14	164	55.8	10.1	5.64	50.16	20.75	23
17	12	145	35.3	7.85	2.77	32.53	16.79	14.5
18	14	180	55.1	8.01	4.41	50.69	17.01	12
19	14	156	82.1	42.39	34.80	47.30	33.74	14
20	13	143	32	14.82	4.74	27.26	15.65	12
21	14	165	54.7	9.17	5.02	49.68	20.09	12
22	14	156	69.3	35.59	24.66	44.64	28.48	12
23	14	183	77	19.77	15.22	61.78	22.99	12
24	14	175	63.4	9.47	6.00	57.40	20.70	16
25	14	163	51	7.97	4.35	48.32	25	16
26	13	147	46.3	17.47	8.09	38.21	21.43	28
27	14	167	62.3	11.09	6.91	55.39	22.34	12
28	14	163	89.1	43.78	33.62	29.96	59.14	32

[1] Order numbers 1-12 correspond to CC group - Costesti Center-Arges; order numbers 13-18 correspond to CS group – Center of Stefănesti-Arges; FATP – Body fat mass expressed as a percentage; FATM- Body fat mass expressed in kilograms; FFM- Fat-free body mass expressed in kilograms; BMI - Body mass index; METAAGE - Metabolic age expressed in years

Table 5 presents the descriptive analysis of the measurements that required the use of the parametric Independent sample t-test. Representative data on the measurements involving the use of the non-parametric Mann - Whitney U test are shown in table 6.

Table 5. Descriptive statistics for measurements performed using Independent sample t-test

Measurements	Center	N	Mean	Std. Deviation	t	df	Sig. (2 tailed)
Static balance	CC	12	49.33	23.811	2.351	26	0.29
	CS	16	69.19	19.627			
CMJ- Height of the center of mass	CC	12	14.908	6.0763	2.398	26	0.024
	CS	16	21.538	8.5451			
Height	CC	12	156.50	10.732	0.931	26	0.361
	CS	16	160.50	11.911			
Lean body mass	CC	12	51.533	18.7426	0.765	26	0.452
	CS	16	56.800	17.0033			
FFM-Fat-free body mass	CC	12	40.3875	9.23955	-0.840	26	0.409
	CS	16	43.5794	10.83807			

Table 6 shows the intergroup statistical-mathematical calculations in which the independent variable was represented by the institutional center. The dependent variables were represented by the results of the tests performed with the aforementioned testing devices. The p-value interpretation of Kolmogorov-Smirnov test required a parametric test (Independent Sample t-test) or a non-parametric test (Mann -Whitney U). The parametric test was used every time that both distributions recorded $p>0.05$. Whenever one or both distributions recorded $p<0.05$, the non-parametric test was used.

Table 6. Significance of the difference between the distributions of measurements per research groups

Measurements	Center [1]	Kolmogorov-Smirnov	P *Kolg-Smirn.*	p-value interpretation	Test	t/U Sig. (2 tailed)	p
Static balance	CC	0.143	0.200	p>0.05	Independent	0.029	p<0.05
	CS	0.202	0.080	p>0.05	Sample t test		
Processing speed - number of stimuli	CC	0.413	0.000	p<0.05	Mann -Whitney U	0.000	p<0.05
	CS	0.186	0.140	p>0.05			
Processing speed-Processing time	CC	0.184	0.200	p>0.05	Mann -Whitney U	0.577	p>0.05
	CS	0.221	0.035	p<0.05			
Processing speed pulses/sec.	CC	0.338	0.000	p<0.05	Mann -Whitney U	0.000	p<0.05
	CS	0.141	0.200	p>0.05			
Dynamic balance - eyes open -Left leg	CC	0.391	0.000	p<0.05	Mann -Whitney U	0.236	p>0.05
	CS	0.234	0.019	p<0.05			
Dynamic balance - eyes open Straight leg	CC	0.273	0.014	p<0.05			
	CS	0.244	0.012	p<0.05	Mann -Whitney U	0.728	p>0.05
Dynamic balance - eyes closed - Left leg	CC	0.323	0.001	p<0.05	Mann -Whitney U	0.642	p>0.05
	CS	0.262	0.004	p<0.05			
Dynamic balance - eyes closed Straight leg	CC	0.350	0.000	p<0.05			
	CS	0.193	0.115	p>0.05	Mann -Whitney U	0.082	p>0.05
CMJ- Height of the center of mass	CC	0.128	0.200	p>0.05	Independent	0.024	p<0.05
	CS	0.196	0.102	p>0.05	Sample t test		
Height	CC	0.144	0.200	p>0.05	Independent	0.361	p>0.05
	CS	0.116	0.200	p>0.05	Sample t test		
Lean body mass	CC	0.200	0.200	p>0.05	Independent	0.452	p>0.05
	CS	0.099	0.200	p>0.05	Sample t test		
FATP-Body Fat Mass (%)	CC	0.182	0.200	p>0.05	Mann -Whitney U	0.889	p>0.05
	CS	0.232	0.022	p<0.05			
FATM-Body Fat Mass (kg)	CC	0.236	0.064	p>0.05	Mann -Whitney U	0.610	p>0.05
	CS	0.259	0.005	p<0.05			
FFM-Fat-free body mass	CC	0.107	0.200	p>0.05	Independent	0.409	p>0.05
	CS	0.159	0.200	p>0.05	Sample t test		
BMI - body mass index	CC	0.273	0.014	p<0.05	Mann -Whitney U	0.286	p>0.05
	CS	0.268	0.003	p<0.05			
METAAGE-Metabolic age	CC	0.385	0.000	p<0.05	Mann -Whitney U	0.495	p>0.05
	CS	0.315	0.000	p<0.05			

Legend: [1]CC- subjects from the Costeşti Argeş Institutionalized Center Group; CS - subjects from the Stefăneşti Argeş Institutionalized Center Group

Discussions

Tables 1 and 2 show the socio-demographic profile of the research subjects. These tables highlight the following matters. The majority of subjects (66.6%) from (CS) group have psychomotor variables consistent with age, formed body schema and established laterality. As for the (CC) group, only 33% present this characterization. At the latter center, 66% of subjects have perceptual distortions of time, space, shape and body schema in formation progress. At CS, cognitive variables representing simple concepts (understanding, defining and operating) are the majority, with values from 87.5% to 93.75%. In the case of CC, the range is wider for the same variables, with results between 66.6% and 100%. Regarding the vocabulary, it is mostly medium developed in both centers (81.25% at CS and 66.6% at CC). As for the oral expression, it is mainly reduced in both centers (56.25% at CS and 75% at CC). Attention presents similar data in the two centers, most subjects manifesting attention disorders (87.5% at CS and 100% at CC). In terms of social variables, the majority of the results are similar. The subjects of both centers are stable and communicative (75% at CS and 66.6% at CC). With regard to the level of school knowledge, most subjects show similar levels, respectively poor ones. At CS the poor results were recorded as follows: reading skills (66.6%), writing (75%) and calculation (75%). As for the results at CC, they show the following poor level: reading skills (58.3%), writing (66.6%) and calculation (41.6%). In conclusion, the socio-demographic variables have relatively similar characteristics at the two institutionalized centers. Adolescents with intellectual disabilities have common psychomotor and behavioral characteristics. Many of these young people present delays in the basic motor skills acquisition and a low physical fitness. Their perceptual-motor difficulties affect their learning and their motivation to take part in physical activities and sports. The successful inclusion of these adolescents in society is favored by a social attitude of acceptance in conditions of equality. (Aharoni, 2005). Some authors studied the effects of specially created physical exercise programs on the physical fitness of children with SEN (ID). They identified a relation between physical fitness and the level of ID (intellectual disabilities). Thus, ID children had significantly lower scores in fitness tests related to the normally developed children (Golubović et al., 2012). Other studies highlighted the benefits of exercising for the skill-related fitness components (SRF) in the ID young people (Jeng et al., 2017). Generally, physical exercise (especially strength training – ST) can be effective in the health of SEN(ID) individuals too. The results showed an increase of strength, balance and fat-free mass, while fat mass and waist

circumference decreased. Thus, the quality of life of SEN (ID) adolescents improved significantly (Jacinto et al., 2021). The specialized literature focused too on the literacy instruction for young people with cognitive disabilities. In this regard, new approaches meant to improve this field are investigated (Roberts, Leko, & Wilkerson, 2013). Specialists also analysed the results of unhealthy diet in children and adolescents. Such a diet could lead to overweight and cardio-metabolic risk and to an impaired cognition and academic performance as well (Naveed, Lakka, & Haapala, 2020). Current studies highlighted that the educational requirements for children with speech, language and communication needs (SLCN) continue in their adolescence and afterwards (Vance & Clegg, 2010). The adolescents with language disorders must be carefully trained for job interviews by means of special intervention programs. These programs develop specific social communication skills that are important for interview success (Mathrick, Meagher & Norbury, 2017). The participation of adolescents with autism spectrum disorder (ASD) in social activities was studied by specialists. A comparison was made with other groups of adolescents with disabilities; the correlates of limited social participation were examined too (Shattuck et al., 2011). Other authors examined how SEN children perceive their relationships with parents, peers and teachers, also their connections with schools. Findings showed that all aspects of the relationships and bonds of children were associated with behavioral, emotional and social adjustment (Murray, & Greenberg, 2006). Studies were conducted to determine the attitude of high school students regarding the adolescents with special educational needs. It is highly important to improve the attitude of both students and teachers towards such adolescents. The special educational needs (SEN) include Tourette Syndrome - TS. Specialists explain that TS is a neuro-behavioral and psychiatric disorder, namely a disability. Therefore, the TS adolescents must be comprehend not punished. Students must learn to accept SEN adolescents as they are (Brook & Boaz, 2006). A survey conducted in high school revealed that students' attitude toward people with disabilities became more positive with increasing age. A correlation was identified between the level of knowledge about special educational needs and the tolerant attitudes regarding SEN adolescents (Brook, & Galili, 2000).

In table 3, it was verified if statistically significant differences can be identified between the two groups of subjects. Such differences help to determine, based on weighted arguments, how to approach the research groups in this matter. The approach could be made using similar (common) ameliorative means or separate (different) ones. The most important characteristic of autism spectrum disorders (ASD) is the difficult social

interaction. This one has notable negative effects on the life quality of ASD individuals. Numerous medical interventions for ASD aim to improve social interaction abilities. An effective tool in that regard is the Program for Education and Enrichment of Relational Skills (PEERS®). This intervention program is meant to produce generalized social cognitive improvements (Herringshaw, 2021).

Other specialists made an analysis on the static balance of young people by measuring their Balance Index. So, they made a comparison between students with severe intellectual disabilities (SID), visual impairment (VI) and non-disabled (ND) students. The tests of static balance were performed eyes open and eyes closed. The major finding was that VI group had lower scores than SID and ND group. All subjects showed that their static balance skills were considerably better on right leg than on left leg (Klavina & Jekabsone, 2014). The impact of vision on visual processing functions and balance in SEN students was studied too. Vision has a major importance in the development of children. Visual impairment (VI) is widespread in students with special educational needs (SEN) and sometimes is not detected in due time. So, optometric examination is essential to improve their visual function (Choi et al., 2022). Studies were carried out to investigate the effect of balance/corrective exercises on balance performance in SEN students with DCD. The Developmental Coordination Disorder (DCD) of the general cognition level influences the verbal, motor and cognitive abilities. Tests were made after 8 weeks of exercising. The results demonstrated that selected balance/corrective exercises improved the static and dynamic balance of these subjects. (Zolghadr, Sedaghati, & Daneshmandi, 2019). Some specialists monitored the cases of overweight in young people. They revealed that such cases are prevalent in the persons with physical and cognitive disabilities compared to the non-disabled persons. Thus, effective strategies for reducing the risk of overweight/obesity in adolescents with disabilities must be developed and implemented (Rimmer, Rowland & Yamaki, 2007). There were analyzed the effects of whole-body vibration (WBV) therapy on the physical fitness of youth with disabilities. Most of the studies showed positive effects of WBV therapy that leads to a better body composition and muscular strength. WBV was proved to be a safe treatment for children and adolescents with disabling conditions (Matute-Llorente et al., 2014).

Analyzing the distributions normality highlights that 15 distributions are normal (46.9%) and 17 (53.1%) abnormal (they are asymmetric or flattened). In the majority of situations, the data are expected to follow a normal distribution. Most of the data should be concentrated around the

mean value and less data should be found at the extremes. Given this fact, in the present case it is observed that most of the distributions do not obey this law. This research shows that SEN institutionalized subjects present significant divergences from a normal distribution. This observation comes from most cases measured at different qualities and skills (in 53.1% of measurements). The abnormality of these distributions highlights that SEN subjects institutionalized in the two centers are quite different from each other. They present a wide range of individual skills and manifestations. As for the research tasks, the analyzed distributions abnormality of 53.1% may affect the data interpretation and the results generalizability. This abnormality may influence the decisions or conclusions which are based on these data. The research groups are represented by the two institutionalized centers. The verifications of the differences reveal however a smaller difference between the groups viewed as a whole. Statistically significant differences were identified in only 4 of the 16 comparisons performed by specific tests. Depending on the case, the Independent sample t-test and the Mann-Whitney U test were used for this purpose. Analyzed individually, these 4 tests show the following values: static balance *[t (26) =2.35, p<0.05]*, processing speed - number of stimuli [U = 10; p<0.05], processing speed – pulses per second *[t (26) =2.39, p<0.05]* and the height of the center of mass [U = 9.50; p<0.05]. Analyzing these skills, one can state that they can be influenced to a small extent by a psychomotor intervention. It is more difficult to influence these skills at the age of adolescence. The results can be weighted, in order to be ignored. The majority of bilateral comparisons, respectively 12 comparisons (75% of the total) present however statistically insignificant differences (p>0.05). Therefore, in order to apply some psychomotor interventions, it is possible to consider that the two groups are similar (Tables 5 and 6). The situation of the persons with Intellectual or Developmental Disabilities (IDD) was studied in terms of quality of life (QOL). It was analyzed the contribution of psychomotor therapy to better adaptive behavior performance and improved QOL in these persons (Freitas & Santos, 2018; Gonçalves & Santos, 2016; Simões et al., 2016).

As it also results from the tables related to the paper, psychomotricity is a key intervention tool. Determining the changes in the psychomotor behavior of SEN adolescents proved that adapted psychomotricity can influence their quality of life.

Conclusions

Adapted psychomotricity is an essential component, having the potential to positively influence the life quality of young people with SEN. The creation of programs adapted to these situations represents a scientific and social necessity. This research analyzes the psychomotor condition of the subjects from the two centers, for establishing common or different intervention programs.

The socio-demographic variables have relatively similar characteristics in the two institutionalized centers. The common characteristics are listed below:

- Cognitive variables are mostly simple in terms of understanding, defining and operating with concepts (with scores between 66.6% and 100%);
- Language and communication are relatively moderately developed regarding the vocabulary (with values from 66.6% to 81.25%);
- Oral expression is reduced (with values between 56.25% and 75%);
- Social variables mostly characterize stable and communicative subjects (values from 66.6% to 75%);
- School knowledge is characterized as poor in terms of reading, writing and calculating as well (values between 41.66% and 75%).

The measured psychomotor variables have also relatively similar variables. This fact is demonstrated by 75% of the measurements that do not show statistically significant differences.

The observed, measured and interpreted data lead to the conclusion that the research groups can be similarly treated. The psychomotor interventions can be applied according to a single common program.

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