

THE INFLUENCE OF THE EXERCISES OF GROSS AND FINE MOTOR SKILLS ON VISUO-MOTOR COORDINATION OF THE CEREBRAL PALSY CHILDREN

Almira Mujkić¹
Zlata Paprić

Original scientific paper

Center for Mental Health, Justice Square Brčko District

Received: 20.08.2013.
Accepted: 05.09.2013.

UDC:616.831-009.11-053.2:796.012.1

ABSTRACT

Visuomotor coordination is referred to eye coordination and to various parts of the body in different activities and games. The aim of the research was to establish the influence of the exercises of gross and fine motor skills on visuomotor coordination of the cerebral palsy children. The sample was the case study where a male person of 3 and a half years old was an examinee. Measuring instrument used was the Test of visuomotor coordination of the gross motor skills of the dominant hand. Data were analyzed by t-test.

Key words: *fine and gross motor skills, visuomotor coordination, cerebral palsy*

INTRODUCTION

Visuomotor coordination is referred to the eye coordination as well as certain parts of the body like: arms, legs, head, shoulders, hips and so on (Mušić, 2005). According to Prstačić (1987), visuomotor coordination is especially important in graphomotor activities that take place thanks to complex structures like afferent-efferent mechanism, which operate in operative systems of perception, motor skills, emotions, attention and memory. The biggest part of manual and school activities made by children are performed by using visuomotor coordination of the gross motor skills of the dominant hand.

Research goal

In this case study the endpoint was to establish the influence of the exercises of gross and fine motor skills as well as the other treatment on development of visuomotor coordination of a cerebral palsy children.

Research hypothesis

The exercises of gross and fine motor skills improve visuomotor coordination of a cerebral palsy children.

MATERIALS AND METHODS

The sample

The sample included the case study where a male person of 3 and a half years old was an examinee at the baseline with the diagnosis Diplegia spastic.

Variable test

According to this, variables are defined: the level of development of visuomotor coordination of the gross motor skills of the dominant hand.

¹Correspondence to:

Almira Mujkić, Center for Mental Health, Justice Square Brčko District
E-mail: mujkicalmira@yahoo.com

Measuring instrument

Measuring instrument used was the Test of visuomotor coordination of the gross motor skills of the dominant hand.

Visuomotor coordination of the gross motor skills of the dominant hand is determined by throwing the rubber ball into 10 concentric circles from a two-meter distance. The test has specific measuring characteristics to measure the things it is designed for.

Manner of conducting the tests

In this case study the level of development of visuomotor coordination of the gross motor skills of the dominant hand is tested by throwing the rubber ball into 10 concentric circles from a two-meter distance. Every circle is marked vertical and horizontal from the centre towards the periphery with numbers from 1 to 10. The aim was to hit the smaller circle. Educational and rehabilitation centre was consisted of the exercises of gross and fine motor skills, perception while performing physical training exercises.

Initial examination was done, with the tendency to change every month during the five months period, followed by final testing.

Data processing methods

Data were analyzed by t-test. The results are presented in tabular.

RESULTS AND DISCUSSION

The results of scoring scale visuomotor coordination of the gross motor skills of the dominant hand

In Table 1. we can see that the measuring was made in five different time points, from February to June, in which period education and rehabilitation treatment was performed. After two weeks of trying to raise ability of visuomotor coordination of gross motor skills of the dominant hand in February and March, no results were achieved except from one hit of 6 points that can be considered accidental. It is obvious that for a month and a half in the period from February to March, these results are achieved: 4 points for the biggest circle numbered one on the scoring scale, 3 points for the next circle in line towards the interior numbered 2, 4 points for the next circle in line numbered 3, 3 points in the circle numbered 4, 4 points in the circle numbered 5, 1 point in the circle numbered 6 and 2 points in the circle numbered 7. In the mentioned measuring point in the examinees, the values numbered eight, nine and ten on the scoring scale weren't achieved, e.i. the abilities of visuomotor coordination were not achieved. Out of 100 attempts of throwing the ball into a system of concentric circles, the number of failures is 79, which is a lot more than a number of shots-21.

Table 1. Distribution of results of the scoring scale of visuomotor coordination of the gross motor skills of the dominant hand for the individual measuring points

	Value points										N	Σ	
	0	1	2	3	4	5	6	7	8	9			10
February	99	0	0	0	0	0	1	0	0	0	0	100	6
March	79	4	3	4	3	4	1	2	0	0	0	100	74
April	57	3	7	8	5	5	5	7	3	0	0	100	189
May	59	9	4	5	2	4	2	5	8	1	1	100	190
June	42	7	8	5	7	6	6	10	1	3	5	100	287

Legend: N= the number of thrown balls into the goal, Σ= number of points

Testing the significance of differences between measuring in different time points

From looking at the results in different points of estimation we can conclude about the trend of children progress in achieving visuomotor coordination of gross motor skills of the dominant hand. From the data in Table 1 it is evident that a major shift has been made in March comparing to February. It can't be proved statistically, but it is not necessary to prove, because we already said that in February only one shot was made and that shot can be considered accidental

so there are no statistical values we can compare to March. It only remains for us to compare statistical values from March, April, May and June.

From the Table 2, where statistic values and results ratio for March and April (in the area of measuring capability of visuomotor coordination of gross motor skills of the dominant hand) we can see that there is a very big statistic difference in achieved success ($t=3,71$; $p<0,01$). The achieved success is definitely a consequence of a systematic work with the respondent both from the educator and rehabilitator and in the family work: motivation of a child to work.

Table 2. Distribution of statistical measurement of value pairs in the estimate point March-April

		March		April					
		N1=100		N2=100					
Statistic values		M1	SD1	M2	SD2	D	Sx1-x2	t	p
Number of		0,74	1,68	1,89	2,6	1,15	0,31	3,71	<0,01
measurments									

Legend: N1, N2= number of measurments; M1, M2= mean; SD1, SD2= standard deviation; D= the difference between the means; Sx1-x2= standard error of the difference between means; t= t test; $p<0,05$.

Comparing the results of the statistic values in the period of one month, from April to May (Table 3) we

can see that a statistically significant improvement isn't achieved.

Table 3. Distribution of statistical measurement of value pairs in the estimate point April-May

		April		May					
		N1=100		N2=100					
Statistic values		M1	SD1	M2	SD2	D	Sx1-x2	t	p
Number of		1,89	2,6	1,90	2,646	0,01	0,38535	0,026	>0,05
measurments									

In Table 4 we can see that a real progress was made in June. Relatively high t-value comparing to the results from May and June ($t= 2, 2545$; $p<0,05$) indicates that

in the last months of the treatment, e.i. from May to June a significant progress was shown, 95% on the level of significance.

Table 4. Distribution of statistical measurement of value pairs in the estimate point May- June

		May		June					
		N1=100		N2=100					
Statistic values		M1	SD1	M2	SD2	D	Sx1-x2	t	p
Number of	1,90	2,646	2,87	3,23	0,97	0,43025	2,2545	<0,05	
measurments									

A similar research was conducted by the author named (Hasanbegović, 2012). He estimated motor skills with deaf and children with hearing. The results of the research led to conclusion that auditory skills are neglected with deaf children because of the motor skills that demand high degree of accuracy of the movements of the hand. The same author stated that it is necessary to create and improve programs to direct oculomotor coordination with that type of children.

Verification of hypotheses

Exercises of gross and fine motor skills have a good influence on visuomotor coordination of the cerebral palsy children.

The results of the research have shown that exercises of gross and fine motor skills have a better influence on visuomotor coordination, and based on this we can conclude that this hypotheses is confirmed.

CONCLUSION

Program contents containing the exercises of gross and fine motor skills improve visuomotor coordi-

nation of the gross motor skills of the dominant hand. Achieving better results in gross and fine motor skills is closely connected to achieving results and visuomotor coordination considering it all makes sensorimotor unity.

REFERENCES

- Hasanbegović, H. and Mehmedović, S. (2012). Distinctive characteristics of deaf and hearing respondents in motor skills. International symposium Sports and health, *Collection of scientific and professional papers*. Tuzla, B&H. pp. 268-271.
- Muhmutagić, A. (2000). Correlation of abilities of visuomotor coordination of gross motor skills of the dominant hand and grasping the correspondence of series of children with mild mental retardation. *Defectology*. 5(5). A magazine for defectology, psychology and theory and practice for working with children, youth and adults with special needs. Tuzla, B&H. pp. 51-55.
- Mušić, E. (2005). *Correlation of visuomotor coordination of gross motor skills of the dominant hand and mathematical abilities of children with mild mental retardation in higher grades of elementary school*. Thesis. Faculty of Education and Rehabilitation. Tuzla.
- Prstačić, M. (1987). Analytic stimulation and graphomotor reproduction of a written template of a subject with cerebral palsy. *Defectology*, 23(2). Zagreb, Croatia. pp. 291-300.