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EVALUATION OF STRENGTH AND FLEXIBILITY OF TRICEPS, SHOULDER AND SCAPULA MOBILITY IN INTELEKTUAL DISABILITIES (ID) CHILDREN

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Abstract

Significant limitations in both intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical adaptive skills are the hallmarks of people with intellectual disabilities. Many studies indicate that compare to typically developing people; persons with intellectual disabilities have more challenges in daily life activities.

The aim of this study is to access the triceps, shoulder strength and flexibility also scapula mobility in intelectual disable children. A total of 33 (23 boys and 10 girls, mean age 13.5 years old) children with intellectual disabilities (ID), randomly selected from a special education school in Shkodra (a city in Albania), were enrolled in this study. To access the triceps and shoulder muscles strength, the "Seated Push-Up Test" was used and for the shoulder flexibility and rotation/mobility, the modified "Apely" test was used.

Children with intellectual disabilities showed differences in flexibility between the left and right arms, specifically flexibility of the right arm reaching up was weaker than that of the left arm reaching up. Girls had a negative flexibility score comparing to boys especially in the right arm up and left arm down. Both genders have lower flexibility in left arm up and right arm down. Boys also showed a higher strength in upper body compared to girls, as reflected in performing time in the push-up test. The data show a strong positive correlation between the two measurements of flexibility (flexibility left arm up and right arm down and flexibility right up left down). However, there is no significant correlation between flexibility and push-up performance. It suggests that flexibility and thrust performance may not be strongly correlated in this particular sample.

Keyworlds: *Intelectual disabilities children, flexibility of upper boody and scapula. Elementary school children. Albania, Tirana*

Introduction

Significant limitations in both intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical adaptive skills are the hallmarks of people with intellectual disabilities. This impairment

began before to the age of eighteen (Schalock et al., 2007). It has been consistently reported that young adults with intellectual disabilities have high rates of overweight and obesity (Melville et al., 2008; Rimmer et al., 2010), are less physically active and lead more sedentary lifestyles than the general population (Frey et al., 2008), and are defined as having significant limitations both in intellectual functioning and in adaptive behavior (including everyday social and practical skills) with onset before the age of 18 years (Schalock, et al., 2007). Studies indicate that compared to typically developing people, people with intellectual impairments may have more challenges with motor development and basic movement skills (Lloyd, 2016) and have poorer levels of physical fitness (Hartman, et al., 2014). People with ID have a high frequency of sedentary behavior, according to a number of research in the literature (Dairo, et al., 2016; Harris, et al., 2018). However, in contrast to the general population, these people have more health risks, including a higher prevalence of obesity, metabolic syndrome, and hypertension (Brooker, et al., 2015; Foley, et al., 2017). Early loss of muscle mass (Carmeli, et al., 2012) is a result linked to poor functional ability, mobility, and other comorbidities, since premature physical aging is a feature shared by most patients with ID (Bastiaanse ,et al., 2012).

The aim of this study is to access the triceps, shoulder and scapula strength and flexibility in intelectual disable children.

Methodology

The study included a sample of 33 children with intellectual disabilities (ID), randomly selected from a special education school in Shkodra, Albania. The selected subjects who were enrolled in this study were 23 boys and 10 girls 9 (average age 13.5 years). Data were colected through direct physical assessments using the "Seated Push-Up Test" to assess the triceps and shoulder muscles strength and the functional shoulder rotation – "Modified Apely Test" for the functional shoulder flexibility and rotation. Tests were conducted in the special education school and data were analyzed using descriptive statistics and inferential statistics. Descriptive statistics, such as mean, standard deviation, and range, were calculated for each measurement. Inferential statistics, including independent samples t-tests and correlations, were performed to examine differences between genders and to identify relationships between variables.

Results

In the first table, based on the tests performed we have presented the measurements for two tests; the Modified Apley's test and the Seated Push-up test.

Table 1. *Descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
Flexibility Left up Right down	33	– 21	5	– 6.6	7.9
Flexibility Right up Left down	33	– 24	5	– 5.6	8.1
Push_ups	34	0	80	28	25.2
Valid N (listwise)	33				

The descriptive statistics shown in Table 1 present flexibility with left arm up and right arm down, with respective min value: –21 cm, and max value: 5 cm, and a mean of: –6.6 cm and a standard deviation: 7.9. On average, the subjects in this group had a negative flexibility score of –6.6 cm, indicating that, on average, the upper arm tends to be less flexible in the uplift than the downlift. The standard deviation of 7.9 indicates a variability in flexibility scores among children. Measuring the flexibility of the right arm reaching up and the left arm reaching down, data shows that flexibility values range from –24 to 5 cm. On average thay had a negative flexibility score of –5.6 cm, indicating that the right arm tended to be less flexible in reaching up compared to the left arm reaching down. Strength of triceps, shoulder and scapula (measured by push-up test) results vary from 0 to 80 seconds on performing push-up bench press test. On average, the children in this group were able to hold the

push-up position for about 28 sec, indicating a significant variation in push-up performance among children.

Table 2 below summarises the descriptive statistics of subjects given in both genders, i.e. boys and girls.

Table 2. *Descriptive Statistics given by genders*

	Gender	N	Minimum	Maximum	Mean	Std. Deviation
Boys	Flexibility Left up Right down	23	– 21	5	– 6.5	8.4
	Flexibility Right up Left down	23	– 21	4	– 5.4	7.7
	Push_ups	23	0	80	30.9	26.4
	Valid N (listwise)	23				
Girls	Flexibility Left up Right down	10	– 20	2.5	– 6.8	7.2
	Flexibility Right up Left down	10	– 24	5.0	– 6	9.5
	Push_ups	11	0	60	22.7	22.7
	Valid N (listwise)	10				

Given the statistical processing presented in Table 2, on flexibility left arm up right arm down is identified that boys had a range of flexibility scores from –21 cm to 5 cm, while girls from –20 cm to 2.5 cm. On average it is evident that boys, regarding the left arm reaching up and their right arm reaching down, had a negative flexibility score of –6.5 cm, suggesting that the left arm tended to be less flexible than the right arm. Whereas, girls had a negative flexibility score, i.e.–6.8 cm. The standard deviation in boys is 8.4 and in girls 7.2 which indicates variability in flexibility scores among boys and girls. In terms of flexibility of the right arm reaching up and the left arm reaching down, the data shows that boys, has a range of flexibility scores from –21 to 4 cm, while girls from –24 cm to 5 cm. Boys had a negative flexibility score of –5.4 cm and girl's negative flexibility score of –6 cm, indicating that the right arm tended to be less flexible than the left arm in girls than in boys. Regarding the push-up test (measuring strength) the number of push-ups in boys ranged from 0 sec to 80 sec and in girls from 0 to 60 sec. On average boys were able to hold the push-up position for about 30.9 seconds while girls 22.7 sec. The standard deviation of 26.4 in boys and 22.7 in girls indicates considerable variability in push-up performance.

Table 3, provides additional group statistics for the measurements, specifically the mean, standard deviation, and mean standard error for each gender.

Table 3. *Group Statistics*

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Flexibility Left up Right down	Boys	23	– 6.5	8.4	1.7
	Girls	10	– 6.8	7.2	2.2
Flexibility Right up Left down	Boys	23	– 5.4	7.7	1.6
	Girls	10	– 6.1	9.5	3
Push_ups	Boys	23	30	26.4	5.5
	Girls	11	22	22.7	6.8

These statistics show that both boys and girls have similar average negative flexibility scores in left up right down (boys –6.5 cm and girls –6.8 cm). Similarly, both boys and girls display comparable mean flexibility scores in right arm up and left arm down tests with values –5.4 cm for boys and –6.1 cm for girls. Boys appear to have a higher average performance in the push up test (30 seconds) compared to girls (22 seconds).

Table 4. *Correlations*

		Flexibility Left up Right down	Flexibility Right up Left down	Push_ups
Flexibility Left up Right down	Pearson Correlation	1	.834**	.184
	Sig. (2-tailed)		.000	.304
	N	33	33	33
Flexibility Right up Left down	Pearson Correlation	.834**	1	.246
	Sig. (2-tailed)	.000		.168
	N	33	33	33
Push_ups	Pearson Correlation	.184	.246	1
	Sig. (2-tailed)	.304	.168	
	N	33	33	34

** *Correlation is significant at the 0.01 level (2-tailed)*

Table 4 presents the correlation coefficients between the variables: flexibility left arm up right arm down, flexibility right arm up left arm down and Push-ups. There is a strong positive correlation (r = 0.834) between flexibility left arm up right arm down and flexibility right arm up left arm down. The correlation is significant at the 0.01 level (p < <0.01), indicating a highly significant relationship between these two measurements. As one measurement increases, the other tends to increase as well. There is a weak positive correlation (r = 0.184) between flexibility left arm up right arm down and Push-ups. However, this correlation is not statistically significant (p > 0.05), suggesting no significant relationship between these two variables. The correlation coefficient between flexibility right arm up and flexibility left up is the same as above (r = 0.834), indicating a strong positive correlation between these measurements. There is a weak positive correlation (r = 0.246) between flexibility right arm up left arm down and Push-ups, but it is not statistically significant (p > 0.05). There is a weak positive correlation (r = 0.184) between Push-ups and flexibility left arm up right arm down, but it is not statistically significant (p > 0.05). There is a weak positive correlation (r = 0.246) between push-ups and flexibility right arm up left arm down, but it is also not statistically significant (p > 0.05).

Conclusions

In conclusion, we can say that children with intellectual disabilities showed differences in flexibility between the left and right arms, specifically flexibility of the right arm reaching up was weaker than that of the left arm reaching up.

Based on gender, we might say that girls had a negative flexibility score comparing to boys especially in the right arm up and left arm down.

Group statistics indicate that both genders have lower flexibility in left arm up and right arm down.

Boys showed upper body strength compared to girls, as reflected in performing time in the Push-up test.

In conclusion we might say that there is a strong positive correlation between the two measurements of flexibility (flexibility left arm up right arm down and flexibility right arm up left arm down). In this study there is no significant correlation between flexibility and push-up performance. There is a strong positive significant correlation between flexibility in left arm up and right arm down and flexibility right arm up left arm down. Also there is a weak positive correlation between flexibility left arm up right arm down and Push-ups which is not statistically significant the same weak positive correlation between flexibility right arm up left arm down and Push-ups, which is not statistically.

Study Limitations

Firstly, the sample size was relatively small, consisting of 33 children; therefore, the findings may not be utilized to make generalizations about the wider population of children. Secondly, the study focused on

the evidence and only assessment of these two physical qualities and did not investigate other factors such as general fitness, health conditions or socio-economic status of these children that may also have affect physical abilities.

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