ASSESSING THE DEVELOPMENT LEVEL OF BASIC MOTOR SKILLS OVERHAND THROW IN CHILDREN AGED 7 TO 10 YEARS

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Abstract

The aim of the research was to determine the level of development of fundamental motor skill of manipulative kind at overhand throw in children aged 7 to 10 years. All groups of participants, statistically are significantly different among themselves except for respondents aged 9 and 10. A monotonously increasing trend was determined in the average score of the skill and the percentage extent of the first criterion. Among students we have not observed constancy by age in terms of the hardest and the easiest manifestation criterion. Monitoring the level of development of students is beneficial for the teacher which enables him to do more effective and efficient planning of the Physical and Health Education classes.

Key words: *students, differences, fundamental motor skills, overhand throw, development*

INTRODUCTION

Basic motor skills are groups of movements that are the building blocks of other complex movements present in sport, recreation, dances and other forms of physical activity (Okely & Booth 2004, Haywood & Getchell, 2005, 2009) and usually occur in the period from the first to the seventh year of life (Burton, 1998).

Fundamental movement skills are movements that involve control or manipulation of objects (Haywood & Getchell, 2005, 2009, SPARC, 2007)., 2009).

The skill overhand throw is a basis for development of other more specialized forms of movements found in sports such as shooting in handball, serving in volleyball, throwing in baseball, javelin throwing etc (Department of Education and Early Childhood Development, 2009).

The aim of the research was to determine the level of development of the skill overhand throw for children aged 7 to 10 years.

METHODS OF RESEARCH

The research covered 137 children aged 7 to 10 years, male students from "PS 11 October" in Skopje (7 years - 32 students, among which 32 at the age of seven years, 33-8, 38-9 and 10 - 34). The students were asked to perform two consecutive throws of a tennis ball with maximal force.

This research uses the Test of Gross Motor Development pattern to estimate the level of development (Ulrich, 2000), where the motor skills of overhand throw are defined by four performance criteria.

For greater objectivity in the assessment, each movement was recorded with two High Speed cameras Sony EX-FH 100 adjusted to 240 fps and placed in the frontal and sagittal plane. Movements were then analyzed using software Kinovea 0.8.7 using multiple options which the program allows.

For each student we calculated the total score of skill which represents the total sum of the registered criteria in two trials.

Determining the differences in the total score between the groups of respondents was done with applied nonparametric analysis of variance (ANOVA) i.e. the Kruskall-Wallis test, and for determination of the significant differences among each group separately, the Mann-Whitney U test was applied.

For determining the presence of criteria that respondents manifested on master level, percentage was calculated (if the respondent manifested the criterion in two trials, then it was registered as a master level).

Data processing was done with the statistical package program SPSS 16.

Table 1. Basic descriptive statistics and Kruskall-Wallis test

Age	Average age (days)	Mini	Maxi	Mean Score	N	Kolmogorov-Smirnov (sig.)	Shapiro-Wilk (sig.)	Kruskall-Wallis test	
								Chi-Square	Asymp. Sig.
7	2517.88	.00	6.00	1.8125	32	.004*	.002*	34.772	.000*
8	2907.85	.00	8.00	3.1818	33	.026*	.045*		
9	3003.14	.00	8.00	4.4211	38	.045*	.009*		
10	3663.32	.00	8.00	5.3824	34	.000*	.001*		

Table 2. Mann-Whitney test for significance of differences among groups

	Age	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Overhand throw	7	32	26.73	855.50	327.500	855.500	-2.684	.007*
	8	33	39.08	1289.50				
	Total	65						
	Age	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Overhand throw	7	32	24.92	797.50	269.500	797.500	-4.035	.000*
	9	38	44.41	1687.50				
	Total	70						
	Age	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Overhand throw	7	32	21.06	674.00	146.000	674.000	-5.172	.000*
	10	34	45.21	1537.00				
	Total	66						
	Age	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Overhand throw	8 god	33	30.70	1013.00	452.000	1013.000	-2.041	.041*
	9 god	38	40.61	1543.00				
	Total	71						
	Age	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Overhand throw	8 god	33	25.09	828.00	267.000	828.000	-3.751	.000*
	10 god	34	42.65	1450.00				
	Total	67						
	Age	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Overhand throw	9 god	38	32.91	1250.50	509.500	1250.500	-1.566	.117
	10 god	34	40.51	1377.50				
	Total	72						

Table 3. Percentage of criteria performed on master level

	Performance criteria	7 year	8 year	9 year	10 year
1.	Windup is initiated with downward movement of hand/arm	(1) 3.125%	(6) 18.182%	(12) 31.579%	(14) 41.176%
2.	Rotates hip and shoulders to a point where the non - throwing side faces the wall	(2) 6.250%	(1) 3.030%	(20) 52.632%	(28) 82.353%
3.	Weight is transferred by stepping with the foot opposite the throwing hand	(9) 28.125%	(21) 63.636%	(22) 57.895%	(27) 79.412%
4.	Follow-throw beyond ball release diagonally across the body toward the non -preferred side	(13) 40.625%	(20) 60.606%	(20) 52.632%	(19) 55.882%

RESULTS

Basic descriptive statistics (Table 1) shows that respondents aged 7 had the lowest average score (1813) and respondents aged 10 had the highest (5383). The data of the respondents were not normally distributed. Therefore, the Kruskall-Wallis test was applied.

After the application of the Kruskall-Wallis test, it has been noted that there are statistically significant differences in the average score among the four groups of respondents (sig. 000 *).

In order to determine which groups of respondents have statistically significant differences among each other, we applied the Mann-Whitney test and it was determined that all groups differ among each other except for students aged 9 and 10.

The analysis of the percentage of criteria performed on the master level (Table 3) showed that they are moving in the range from 3.125 to 40.625% in the respondents aged 7, 3.030-63.636% in the 8 year olds, 31.579 to 57.895% in 9 year olds and 41.176 to 82.353% in 10 year olds.

DISCUSSION

In terms of the average score by students of the four groups there is a monotonous increasing trend (Table 1). In terms of average score these statistics groups differ among themselves, except for students aged 9 and 10.

Overhand throw was defined by four criteria, two of which defining movement of the hands, one defines movement of the trunk and one the leg movement. The lowest percentage and thus the most difficult for manifestation at the respondents aged 7,9 and 10 is the first criterion which is defined “wind up is initiated with downward movement of hand/arm”, while for the 8 year olds the second criterion is the most difficult “rotates hip and shoulders to a point where the non-throwing side faces the wall”.

The highest percentage i.e. the easiest for manifestation among 7 year olds is the fourth criterion, among 8 and 9 year olds the third criterion, while among 10 year olds the second criterion. A monotonous increasing trend in the percentage of master level was present only in the first criterion.

Such diversity in terms of representation of the most difficult and the easiest criterion for manifestation among groups may be due to the small number of students included in our research, and that the analysis was conducted by only one analyzer. However, if more respondents are present we could obtain a more comprehensive idea and generalization of greater size, and with the inclusion of more analyzers we would gain greater objectivity in the assessment.

Such research was conducted by Ulrich (2000) where he observed that according to the percentage of master level, the lowest percentage among students aged from 7 to 10 was the second criterion, and the highest percentage for 7 year olds was the first criterion, while among the respondents 8, 9 and 10 years old the fourth criterion. In the second and third criteria a monotonous increasing trend in the percentage of master level was observed.

Knowing the level of development of the skills is important because learning other more complex skills depend on the proficiency of basic motor skills (Delaš, et al, 2008). This information can give the teacher a clear picture of the activities that he should conduct for more effective and efficient implementation of instruction. Such information is relevant for professionals who create curriculums as well as for parents who are interested to have insight at the level of development.

CONCLUSION

From everything presented so far, it can be concluded that the students aged 7 to 10 years have statistically significant differences in the level of development of skill overhand throw. Statistically

significant difference has not been established among respondents aged 9 and 10.

Among the students, constancy by age in terms of the most difficult and the easiest criterion for manifestation was not observed.

A monotonous increasing trend was present in the average score of the skill and in the first criterion that defines the movement of the arm.

Such an approach in the assessment of the level of development of skills should be an integral part of the work of every teacher of Physical and Health Education. By doing so, the teacher will have insight into the effects of his work and thus will be able to properly plan and program the lessons for the students.

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ПРОЦЕНКА НА НИВОТО НА РАЗВОЈ НА ОСНОВНИТЕ МОТОРНИ ВЕШТИНИ ФРЛАЊЕ НА ТОПЧЕ НАД РАМО КАЈ ДЕЦА НА ВОЗРАСТ ОД 7 ДО 10 ГОДИНИ

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(Оригинален научен труд)

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Апстракт

Целта на истражувањето беше да се утврди нивото на развој на основната моторна вештини од манипулативен вид фрлање на топче над рамо кај деца на возраст од 7 до 10 години. Сите групи на испитаници статистички значајно се разликуваат меѓу себе освен испитаниците на 9 и 10 годишна возраст. Утврден беше монотоно растечки тренд во просечниот скор на вештината и во процентуалната застапеност на првиот критериум. Кај испитаниците не се забележа константност според возраста во однос на најтешкиот и најлесниот критериум за манифестирање. Следењето на нивото развој кај учениците е од корист за наставникот со што се овозможува поефективно и поефикасно да го испланира часот по физичко и здравствено образование.

Клучни зборови: *ученици, разлики, основни моторни вештини, фрлање на топче над рамо, развој*