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A PRELIMINARY EVALUATION OF THE CHILDREN'S COMPETITIVE PERFORMANCE IN TRACK & FIELD EVENTS AT THE OLYMPIC FESTIVAL OF KINDERGARTENS

VREDNOVANJE NATJECATELJSKE AKTIVNOSTI DJECE U ATLETSKIM DISCIPLINAMA OLIMPIJSKOG FESTIVALA DJEČJIH VRTIĆA

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SAŽETAK

Provedeno je istraživanje na uzorku od 512 djevojčica i 548 dječaka, prosječne dobi šest godina, sudionika na Olimpijskom festivalu dječjih vrtića tijekom 2007. godine. Analizirani su rezultati u tri atletske discipline; trčanje na 50 m, skok udalj iz mjesta i bacanje loptice. Izračunata je i utvrđena razlika između pojedinih subuzoraka u odnosu na spol u pojedinim atletskim disciplinama. Predložene su ocjene i bodovi vrednovanja pojedinih natjecateljskih postignuća procijenjeni pomoću tablica i dijagrama frekvencija razvrstanih u deset razrednih skupina. Ovaj prijedlog bodova i ocjena za vrednovanje postignuća u atletskim disciplinama za predškolce je prvi prijedlog koji bi se mogao uz eventualnu dodatnu provjeru koristiti kao novi način bodovanja u novim sustavima natjecanja (npr. višeboju) za djecu predškolske dobi i nižih razreda osnovne škole.

Ključne riječi: djeca, atletske discipline, vrednovanje postignuća

SUMMARY

This study has been carried out on a sample of 512 girls and 548 boys who participated in “Olympic Festival of Kindergartens” in 2007. The children were, on average, six years of age. We analyzed the results in the following track & field events: 50-m sprint, standing long jump and softball distance throw. The aim of the study was to determine the gender differences in all of the observed events. For that purpose, we created a proposal for the evaluation of children's performance in each event. The proposal for evaluation, that has been estimated using frequency tables and charts, consists of marks and points arranged in ten clusters. It is important to stress that this is the first proposal for the evaluation of children's performance in track & field events. We think that our proposal could be used as a new method of performance evaluation in certain track & field competitions as well as in children's competitions in kindergartens as well as in schools.

Key words: children, track & field events, performance evaluation

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INTRODUCTION

In 2002 Croatian Olympic Committee through the Office for Local Sport started the organization of sports competitions among Croatian kindergartens under the title "Olympic Festival of Kindergartens" (in further text: Festival). Every kindergarten in Croatia has a right to participate in the Festival. During last five years the Festival had a precisely defined competition system from the local to the national level. In 2007, 13 960 pre-school boys and girls from 349 kindergartens took part in this project of the Croatian Olympic Committee. In addition to football for boys and girls, the most important athletic disciplines are long jump, 50-metre sprint, throwing the ball and 4x25 m relay. These athletic disciplines are adjusted to pre-school age. They can be performed in a sequence of more or less complicated forms of performance. In the very process of preparing children for the competition, with regard to the period of their development, the development of their motor and functional abilities and, therefore, their correct growth and development and overall health condition can be significantly influenced through adequate physical exercise.

Longitudinal studies of the development of morphological and motor characteristics of pre-school children show that the period between 5 and 7 years is characterized by a more intensive development of motor abilities in boys and girls. The biggest changes are evidenced in repetitive strength, coordination, precision and balance. These changes are especially pronounced in the sixth year of age and are more prominent in girls. Gender differences in motor field show girls' superiority regarding balance and flexibility and boys' superiority in dynamic strength and precision (4). Popović et al. (2006) determined the trend of the development of pre-school children motor abilities on the sample of 609 boys and 587 girls. The results of 7 motor tests with regard to children's gender and age

(age groups defined at six-months intervals) were analyzed. The trend of the development of motor abilities is of the same intensity regarding the sex and has the progressive development regarding the age. The results point at the uniqueness and interconnectedness of motor abilities, i.e. the influence on the one ability has a direct impact on the development of other abilities (7). Planinšec (2001) established the relation between motor dimensions and cognitive abilities in boys and girls of 5. 5 years of age. General cognitive and motor abilities were estimated on the sample of 189 girls and 203 boys applying RAZKOL tests. The connection between cognitive abilities and dynamic strength, balance and speed of simple movements has been found in girls while in boys the relation between cognitive abilities and dynamic strength did not show statistically significant results. In addition, the same author has established the motor types of 6-year-old boys (6). On the sample of 242 boys 28 motor tests were measured intended to estimate the coordination of the whole body, arms and shoulder area, agility, explosive strength, dynamic strength, movement frequency and balance. The analysis of the results confirmed the existence of general motor ability characterized by information and energetic movement components, and on the basis of which three groups of motor types of boys were obtained based on Ward's method application. The first type was characterized by better results in the overall motor space, especially in movement speed, agility, dynamic strength and arm coordination. The second type achieves the average results of motor efficiency, and the third lower motor efficiency especially in dynamic strength, whole body coordination, agility, arm coordination and balance.

The stated methodological approaches and results of the mentioned research will be used in the interpretation of the results of this paper. The goals of this research are: 1. to establish quantitative values of pre-school children in three athletic disciplines; 2. to establish gender differences and 3. to suggest points and marks for the evaluation of pre-school children's results in three athletic disciplines.

SUBJECTS AND METHODS

Boys and girls, on average six years old, from kindergartens all over Croatia took part in this research. They participated in competitions in the athletic disciplines standing long jump, 50-m sprint and throwing the ball (softball) within the Olympic Festival of Kindergartens in 2007.

The sample in this research was made of sub samples of 512 girls (170 in softball throwing for distance, 188 in the long jump and 190 in 50-m sprint) who attend older kindergarten groups in the Republic of Croatia.

Basic descriptive parameters were calculated. Differences between individual sub samples in variables were tested by means of T-test for independent samples. The evaluation of individual competition achievements/results was calculated by means of tables and diagrams of frequencies divided in ten class groups and estimated by points and marks. The results were analyzed by means of the package STATISTICA for Windows, ver. 6.0 at the Faculty of Kinesiology of the University of Zagreb.

RESULTS AND DISCUSSION

Basic descriptive parameters have been described in Table 1. The results in all analyzed variables show higher average results in boys. These results are in accordance with past notions regarding the differences in dynamic strength between boys and girls (2). The biggest differences between boys and girls have been noticed in the variable of softball throwing for distance. The superiority of boys in this variable could, taking into consideration the results of the previous research, be explained by gender differences in morphological space characteristic for the age of 6 years (4). Motor tasks used to estimate dynamic strength, according to the results of past research (5, 6) for girls represent a problem situation and movement regulation on the cortical level. Motor programme for legs, according to Planinšec (2001), are formed after the programme for arms, thus the performance of the complex motor tasks with prevailing leg movements require the regulation on the cortical level.

Table 1. Basic descriptive parameters of boys and girls in the following athletic disciplines: throwing the ball, standing long jump and 50 m - sprint
Tablica 1. Osnovna deskriptivna statistika dječaka i djevojčica predškolskog uzrasta u atletskim disciplinama bacanje loptice, skok u dalj iz mjesta i trčanje 50 m

	N	AS	MIN	MAX	SD	Skew	Kurt	maxD
Throwing the ball – boys (m)	170	16,48	3,97	28,34	4,50	0,07	-0,27	0,04
Throwing the ball – girls (m)	169	10,44	4,20	20,71	3,02	1,00	1,38	0,09
Long jump- boys (m)	188	1,42	1,04	1,79	0,15	-0,20	-0,22	0,05
Long jump - girls (m)	143	1,33	0,48	1,70	0,19	-1,19	2,70	0,09
50-m sprint –boys (sec.)	190	9,80	7,59	12,44	0,87	0,22	0,38	0,05
50-m sprint –girls (sec.)	200	10,14	7,34	14,00	0,91	0,41	2,61	0,07

The lower result in softball throwing for distance test can be explained by the complexity of the whole body movement structure and we can suppose that such movements in girls are more under the influence of information than energetic factors.

From minimum and maximum result values a large range of results is visible, which points out the problems that children encounter in measuring their achievements. The biggest problems are in performance errors especially in case of more demanding motor tasks. The authors of past research, which refers to pre-school children samples, point out that certain problems connected to measuring procedures in pre-school children cannot be avoided. In addition to the above mentioned, a large range of results in some disciplines can be a consequence of the participation of children who started attending sports programmes organized in some pre-school institutions at the age of four, which points out the fact that children who regularly exercise at the age of four show superior quality in motor abilities compared to the children who are not engaged in sports programmes (2).

T-test result analysis (Table 2) shows the statistically significant difference of arithmetic means regarding the gender, which is visible from graphic illustration of arithmetic mean position of the analyzed athletic disciplines (Figures 1 to 3).

On the basis of the analysis of tables and diagrams of frequency, Table 3 shows the calculated norms for boys and girls in every analyzed athletic discipline, divided in ten point classes which, on the basis of Lickerts' scale, have been organized in 5 categories/classes/marks (very badly-badly- well-very well- excellent).

The suggested points and marks can be useful to kindergarten teachers and professors of kinesiology in pre-school institutions for the comparison of boys and girls' achievements during the preparations for the participation in the Festival. The evaluation of results through points and marks, informing parents and children about motor tasks, by means of which we can influence

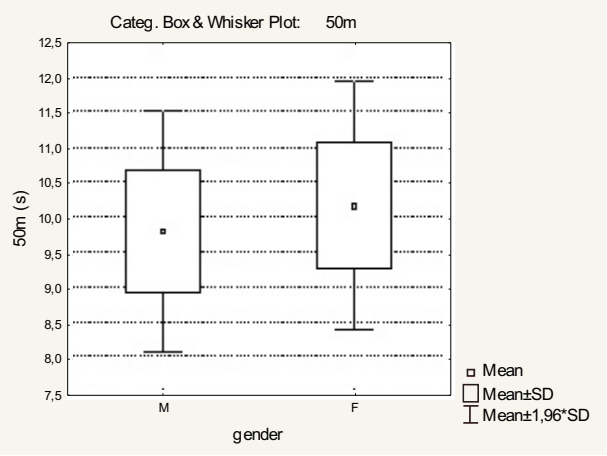

Figure 1. Graph representing gender differences in 50-m sprint
Slika 1. Grafikon razlika u disciplini trčanje 50 m obzirom na spol ispitanika

the development of individual motor abilities dominant in some athletic disciplines, can contribute to higher motivation of children and their parents. In addition to that, based on the analysis of present achievements and suggested table of point and mark evaluation, a big importance is attributed to the cooperation between kindergarten teachers and professors of kinesiology in kindergartens who, on the basis of initial measurements, should make working programmes for homogenized groups with regard to the result and gender. This approach of cooperation and partnership can significantly contribute to the development of sports culture of children, parents and teachers. At the same time, during the phase of making and implementing the working programme, special attention should be paid to the characteristics of the developmental period especially in the choice and distribution of the content and burden of work.

Table 2. Gender differences for every athletic discipline estimated with T-test
Tablica 2. Razlike prema spolu izračunate T-testom za tri atletske discipline

Discipline	Number of boys	Number of girls	AS boys	AS girls	t-value	Df	P
Throwing the ball	170	169	16,48	10,44	-14,52	337	0,00
Long jump	188	143	1,42	1,33	5,11	329	0,00
50-m sprint	190	200	9,80	10,14	3,83	388	0,00

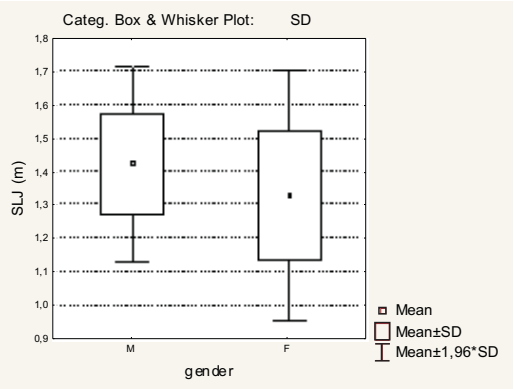

Figure 2. Graph representing gender differences in long jump
Slika 2. Grafikon razlika u disciplini skok udalj iz mjesta obzirom na spol ispitanika

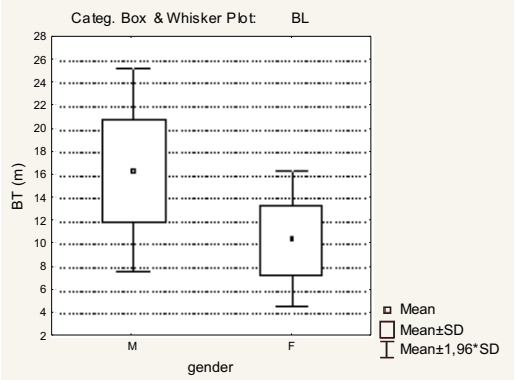

Figure 3. Graph representing gender differences in throwing the ball
Slika 3. Grafikon razlika u disciplini bacanje loptice obzirom na spol ispitanika

Table 3. The proposal of the points and marks with the purpose to estimate achievements of boys and girls in the following athletic disciplines: throwing the ball, standing long jump and 50 m - sprint
Tablica 3. Bodovi i ocjene za vrednovanje atletske uspješnosti dječaka i djevojčica predškolskog uzrasta u atletskim disciplinama bacanje loptice, skok u dalj iz mjesta i trčanje 50 m

Throwing the ball boys	Throwing the ball girls	Long jump boys	Long jump girls	50-m sprint boys	50-m sprint girls	points	mark
... 26,51	... 21,00	... 1,85	... 1,71	... 7,50	... 7,70	10	5 -excellent
26,50 ... 24,00	20,99 ... 19,00	1,84 ... 1,75	1,70 ... 1,62	7,51 ... 8,20	7,71 ... 8,40	9	
21,50 - 23,99	18,99 ... 17,00	1,74 ... 1,65	1,61 ... 1,53	8,21 ... 8,90	8,41 ... 9,10	8	4- very well
19,00 - 21,49	16,99 ... 15,00	1,64 ... 1,55	1,52 ... 1,44	8,91 ... 9,60	9,11 ... 9,80	7	
16,50 - 18,99	14,99 ... 13,00	1,54 ... 1,45	1,43 ... 1,35	9,61 ... 10,30	9,81 ... 10,50	6	3 – well (average)
16,49 ... 14,00	12,99 ... 11,00	1,44 ... 1,35	1,34 ... 1,26	10,31 ... 11,00	10,51 ... 11,20	5	
13,99 ... 11,50	10,99 ... 9,00	1,34 ... 1,25	1,25 ... 1,17	11,01 ... 11,70	11,21 ... 11,90	4	2 - badly
11,49 ... 9,00	8,99 ... 7,00	1,24 ... 1,15	1,16 ... 1,08	11,71 ... 12,40	11,91 ... 12,60	3	
8,99 ... 6,50	6,99 ... 5,00	1,15 ... 1,05	1,07 ... 0,99	12,41 ... 13,10	12,61 ... 13,30	2	1 – very badly
6,49 ...	4,99 ...	1,04 ...	0,98 ...	13,11 ...	13,31 ...	1	

Judging from available information, this is the first suggestion for the evaluation of achievements in athletic disciplines for pre-school children which can be used as the new points-system in the new competition system (e.g. all-round competition) for children of pre-school and school age.

CONCLUSIONS

On the basis of the results in three athletic disciplines: throwing the ball (softball), standing long jump and 50-m sprint, it can be concluded that in the analyzed athletic disciplines girls statistically differ significantly from boys with the advantage of boys' results achievements. The results of this research contribute to and confirm the results of past research of pre- school motor abilities. Points and marks for the evaluation of six-year-old boys and girls' athletic achievements have been suggested and calculated. The suggested points and marks can be used as a benchmark for the control of work with pre-school children in the process of monitoring of the effect of work. By this approach of result quantification and norm suggestion at the same time the new points-system is suggested, which can be used during the preparation of children for athletic competitions.

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