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Original article

ROLE OF MOVEMENT GAMES IN TRAINING THE COORDINATION, BALANCE AND STABILITY OF THE PRESCHOOLERS

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Abstract[*]

Aim. The scope of the research was to highlight the benefits of the movement games in the education and improvement of coordination, balance and stability of the children of pre-school age.

Methods. The research methods were established based on the research goals, and, therefore, the method of reference study was used, the test method, the statistical mathematical method and the graphical method (Ababei, 2006).

Results. Movement games have wider impact on children who are in the physical and mental development period. Along with the satisfaction and joy, dynamic games have a significant impact on the psycho-motric skills and traits of character, and, why not...it represents a major link of the action chain with influence on motric development, harmoniously combining the training and educational element to the fun and high spirits element.

Conclusions. As a result of the research, the conclusion drawn is that by selection and implementation of the age-specific games, the psycho-motric capacity, coordination, balance and stability are educated and improved.

Keywords: game, movement, education, preschool.

Introduction

A series of significant changes that do not only consist of physical and mental development or in building-up knowledge and skills take place. Child's development must be carefully monitored, due to the changes that it faces have consequences on the next stages of age.

At preschool age, the child's body is in full growth and, therefore, any and all conditions must be created for coping with the natural need to move, for helping them to reach a balanced development of the entire body.

Movement and physical exercise are the main means of development of the children's body. Apart from the balanced body development, the physical exercise reinforces the will, cultivates the patience, the self control, the courage, initiative, assiduity, discipline, develops their collective spirit and their self confidence. From the oldest times, the movement games were used as means to prevent illnesses or to treat them, to correct physical deficiencies, to harden the body and to achieve an appropriate posture. Children must be taught from early childhood to love outdoor movement, to make sport, to be agile and courageous, and to trust their own forces.

Movement games are the main means to achieve the tasks of the physical education in kindergarten. In such games, the movement element becomes essential and the games become attractive to children, (Stănescu, Ciolcă, Urzeală, 2005).

Movement games stand out from the other means of the physical education through specific peculiarities. Movement games allow for simultaneous development of basic motric skills, of motric qualities, of moral and will abilities and skills. All these are improved through game as a result of complex connections established between them. Simultaneous effort is directly proportional to the actual game complexity (Ochiană, 2006).

Methods

The research activity was performed in a 8-month period, between October 12th, 2015 and June 15th, 2016. The actual research consists of implementation of the evaluation tests to the selected experimental group of subjects, as well as of the implementation of programs aimed at training and improvement of coordination, balance and stability, and it took place between January 11th and May 20th 2016. The experimental group of subjects included a group of 16 preschoolers aged between 5 and 7, representing children of the big children group and the school preparation children group. The group of subjects was divided in two lots, meaning the experimental lot and the control lot.

Despite the children's small age, they collaborated pretty well in the performance of the

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set of tests and dynamic games.

Following the interpretation of tests and obtainment of the initial values, the group work was focused on the preschoolers who obtained a score lower than expected. I would like to specify that I have not encountered problems of collaboration or understanding with the little ones, and the entire research was also performed in the careful presence of the relevant educator. The movement tests and games implemented were explained to the subjects in a language appropriate for the kindergarten children, as to understand the peculiarities of the requested gesture or exercise.

In this research I have conducted 3 programs specific to the research's scope, that included three parts, meaning the beginning part(warming exercises), the fundamental part (movement games specific to training and improvement of coordination, balance and stability) and the closure part (includes exercises of recovery after effort), with a max. duration of 50 minutes and these programs were only implemented on the experimental lot.

The set of tests was designed to investigate the level of motive development, in terms of coordination, balance and stability, the data being recorded in the individual sheets of the preschoolers, and, therefore, the tests for the coordination evaluation are represented by the segmental coordination - Bruininks-Oseretsky test, the coordination of the upper limbs - Bruininks-Oseretsky test, general coordination –Matorin test.

Segmental coordination - Bruininks-Oseretsky test – the testmeasures the capacity of coordination of the movements performed simultaneously with the segments of both parts of the body.

Coordination of the upper limbs - Bruininks-Oseretsky test – the test measures the capacity of coordination of the arms movement, the accuracy of arms and fingers movement as well as various aspects of visual motive coordination, (Manole, Manole, 2009: 139, Albu, Albu, 1999).

General coordination – Matorin test – the subject makes the highest jump without moving, with rotation around the longitudinal axle of the body. A circle is drawn on the ground, divided into 8 dials of 45º each; the subject leaves from the position of standing with the legs on the sides of a certain line that delimits a dial, makes a jump with rotation to the left, and then a jump with rotation to the right; after landing, the dials exceeded are measured. Each and every exceeded dial receives 2 points, for one jump with 360º rotation, and 16 points may be obtained in total. Another 2 points are granted for maintaining balance during the execution and 2 points for landing on the detachment spot, for the entire exercise being able to obtain in total 20 points, (Tudor, 2013: 161, 168).

The aim of the research was to highlight the benefits of the movement games in training and improvement of coordination, balance and stability of the preschoolers.

As *research methods* I have used: the method of the bibliographical study, the observation method, the experimental method, the tests method, the statistical mathematical method and the graphical method.

Results

Table no. 1 includes the general results of the subjects (the work experimental group) obtained following the initial and final evaluation of the segmental coordination, upper limbs coordination, general coordination, balance and vestibular stability.

Results interpretation

After analyzing the obtained initial and final values from table nos. 1, 2, and 3, one may observe that the subjects actually covered by the research (the work experimental group) obtained positive values in terms of coordination, balance and stability, against the control subjects who obtained a minor increase of the values following the evaluations.

Within the work experimental group, in terms of segmental coordination, at the initial test the lowest score obtained was 31, and the highest score was 36/55 points, and, at the final test, the lowest score obtained was 51, and the highest score was 55/55 points, with a minimum difference of 16 points and maximum difference of 20 points.

In case of evaluation of the upper limbs coordination, the subjects obtained at the initial test a minimum score of 19 points and a maximum score of 28 points/43, and, at the final test, a minimum score of 39 points and a maximum score of 42 points/43, with a minimum score difference of 11 points and maximum score difference of 23 points.

Within the evaluation of the general coordination, through the Matorin test, at the initial test, the lowest score obtained was 8, and the highest score obtained was 12/20 points, and, at the final test, the lowest score obtained was 16, and the highest score obtained was 20/20 points, with a minimum score difference of 8 points and a maximum score difference of 10 points.

In terms of the global score obtained by the subjects for the coordination evaluation through the Bruininks-Oseretsky test and the Matorin test, at the initial test, the minimum score obtained was 66 points, and the maximum score obtained was 69 points/118, and, at the final test, the minimum

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score obtained was 106 points, and the maximum score obtained was 118 points/118, with a minimum score difference of 37 points and a maximum score difference of 49 points.

Table no. 1 General results of the subjects, obtained following the initial and final evaluation (experimental work group)

Evaluation...	Test	First name and forename							
		B.T.	M.S.	I.D.	B.E.	D.G.	R.D.	D.E.	P.S.
of the	T.I.	35	35	31	32	33	36	36	33
segmental	T.F.	51	51	51	51	52	55	53	51
coordination									
Score difference		**16**	**16**	**20**	**19**	**19**	**19**	**17**	**18**
of upper limbs	T.I.	23	23	28	19	26	23	19	24
coordination	T.F.	42	42	39	39	41	43	42	41
Score difference		**19**	**19**	**11**	**20**	**15**	**20**	**23**	**17**
of general	T.I.	8	10	8	8	8	10	12	12
coordination	T.F.	16	18	18	18	16	20	20	20
Score difference		**8**	**8**	**10**	**10**	**8**	**10**	**8**	**8**
Total	T.I.	66	68	67	59	67	69	67	69
coordination	T.F.	109	111	108	108	109	118	115	106
score									
Score difference		**43**	**43**	**41**	**49**	**42**	**49**	**48**	**37**
of balance	T.I.	22	28	24	24	28	23	26	26
	T.F.	41	45	40	43	44	45	43	44
Score difference		**19**	**17**	**16**	**19**	**16**	**22**	**17**	**18**
of vestibular	T.I.	18	20	25	20	22	19	18	20
stability	T.F.	10	14	16	12	10	10	8	10
Score difference		**8**	**6**	**9**	**8**	**12**	**9**	**10**	**10**

Key:
T.I. - initial test; **T.F.** - final test

Table no. 2 includes the general results of the subjects (control experimental group), obtained following the initial and final evaluation of the segmental coordination, of the upper limbs coordination, of general coordination, of balance and vestibular stability.

Table no. 2 General results of the subjects obtained following the initial and final evaluation (control experimental group)

Evaluation of	Test	First name and forename							
the...		C.T.	S.M.	O.B.	T.C.	D.A.	E.R.	C.I.	S.P.
segmental	T.I.	31	33	29	32	32	33	33	34
coordination	T.F.	36	35	32	32	33	39	40	38
Score difference		**5**	**2**	**3**	**0**	**1**	**6**	**7**	**4**
upper limbs	T.I.	25	18	23	24	23	21	24	21
coordination	T.F.	25	27	26	24	25	28	26	24
Score difference		**0**	**9**	**3**	**0**	**2**	**7**	**2**	**3**
general	T.I.	12	8	10	10	8	8	8	10
coordination	T.F.	14	10	10	14	10	10	12	14
Score difference		**2**	**2**	**0**	**4**	**2**	**2**	**4**	**4**
Total score	T.I.	68	59	62	66	63	62	65	65
coordination	T.F.	75	72	68	70	68	77	78	76
Score difference		**7**	**13**	**6**	**4**	**5**	**15**	**13**	**11**
balance	T.I.	25	25	26	22	24	22	24	26
	T.F.	32	31	27	27	29	27	26	29
Score difference		**7**	**6**	**1**	**5**	**5**	**5**	**2**	**3**
Vestibular	T.I.	20	20	22	18	25	22	20	19
stability	T.F.	15	18	18	15	23	20	18	18
Score difference		**5**	**2**	**4**	**3**	**2**	**2**	**2**	**1**

Key:
T.I. - initial test; **T.F.** - final test.

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Tables no. 3 includes the results of the arithmetical means, of the initial and final values, regarding the evaluation of coordination, balance and stability of the experimental group of subjects covered by the research.

Table no. 3Arithmetical mean of the initial and final values regarding the evaluation of coordination, balance and stability of the experimental group of subjects

Evaluation of...	Work experimental group		Control experimental group	
	Initial	Final	Initial	Final
coordination	66.5	110.5	63.5	73
balance	25.12	43.12	24.25	28.5
stability	20.25	11.25	20.75	12.12

Regarding the balance evaluation, at the initial test, the lowest score obtained was 22, and the highest score obtained was 28/48 points, and, at the final test, the lowest score obtained was 40, and the highest score obtained was 45/48 points, with a minimum score difference of 16 points and a maximum score difference of 22 points.

In case of evaluation of the vestibular stability, the subjects have obtained at the initial test a minimum value of 18 cm and a maximum value of 25 cm, and, at the final test, the subjects have obtained a minimum value of 8 cm and a maximum value of 16 cm, with a minimum difference of 6 cm and a maximum difference of 12 cm.

Within the control experimental group, in terms of the segmental coordination, at the initial test, the lowest score obtained was 29, and the highest score obtained was 34/55 points, and, at the final test, the lowest score obtained was 32, and the highest score obtained was 40/55 points, with a minimum score difference of 0 points and a maximum score difference of 7 points.

In case of evaluation of the upper limbs coordination, the subjects have obtained at the initial test a minimum score of 18 points and a maximum score of 25 points/43, and, at the final test, a minimum score of 24 points and a maximum score of 28 points/43, with a minimum score difference of 0 points and a maximum score difference of 9 points.

Within the evaluation of the general coordination, through the Matorin test, at the initial test, the lowest score obtained was 8, and the highest score obtained was 12/20 points, and, at the final test, the lowest score obtained was 10, and the highest score obtained was 14/20 points, with a minimum score difference of 0 and a maximum score difference of 4 points.

Regarding the global score obtained by the subjects for the coordination evaluation through the Bruininks-Oseretsky test and the Matorin test, at the initial test, the minimum score obtained was 59 points, and the maximum score obtained was 68 points/118, and, at the final test, the minimum score obtained was 68 points, and the maximum score obtained was 78 points/118, with a minimum difference of 4 points and a maximum difference of 15 points.

In terms of the balance evaluation, at the initial test, the lowest score obtained was 22, and the highest score obtained was 26/48 points, and, at the final test, the lowest score obtained was 26, and the highest score obtained was 32/48 points, with a minimum difference of 1 points and a maximum difference of 7 points.

In case of evaluation of the vestibular stability, the subjects have obtained at the initial test a minimum value of 18 cm and a maximum value of 25 cm, and, at the final test, a minimum value of 15 cm and a maximum value of 23 cm, with a minimum difference of 1 cm and a maximum difference of 5 cm.

According to table no. 3, regarding the coordination evaluation through the Bruininks-Oseretskyand Matorin tests, at the initial test, the mean score obtained by the work experimental group was 66.5, and, at the final test, was110.5, with a difference of 44 points. The control experimental group recorded at the initial test a mean score of 63.5, and, at the final test, 73, with a difference of 9.5 points.

Within the balance evaluation through the Bruininks-Oseretsky test, at the initial test, the mean score obtained by the work experimental group was 25.12, and, at the final test, 43.12, with a difference of 18 points. The control experimental group obtained, at the initial test, a mean score of 24.25, and, at the final test, a mean score of 28.5, with a difference of 4.25 points.

At the evaluation of the vestibular stability, at the initial test, the mean score obtained by the work experimental group was 20.25, and, at the final test, 11.25, with a difference of 9 points. The control experimental group obtained, at theinitial test, a mean score of 20.75, and, at the final test, 12.12, with a difference of 8.63.

As comparative data, of the work experimental group and of the control experimental group, one may observe in the table no. 3 the arithmetical means of the values obtained, as it follows: regarding the coordination evaluation through Bruininks-Oseretsky and Matorin tests, at the initial test, the score was 66.5/63.5, with a

difference of 3 points, and, at the final test, the obtained score was 110.5/73 points, with a difference of 37.5 points.

Regarding the balance evaluation through the Bruininks-Oseretskytest, at the initial test, the mean score obtained by the work experimental group was 25.12, and the mean score obtained by the control experimental group was 24.25, with a difference of 0.62; at the final test, the mean score of the work experimental group was 43.12, and of the control experimental group was 28.5, with a difference of 18.87 points.

In case of vestibular stability evaluation, at the initial test, the mean score obtained by the work experimental group was 20.25 cm, and the mean score obtained by the control experimental group was 20.75 cm, with a difference of 0.50 cm; at the final test, the work experimental group obtained 11.25 cm, and the control experimental group obtained 12.12 cm, with a difference of -0.87 cm.

Discussions

In 2001, Moţet considers that the development process is based on movement, that is continuously getting richer, connecting the biological element to the psychological and expertise element. Step by step, child's motor behaviour makes sense, it becomes a conduct and fits within psycho-motricity, mobilizing the entire personality.

Movement games are used at the pre-school age as a means of general physical development. It provides conditions that promote complex development of motric skills and physical qualities needed in life. Practice of movement games contributes to building-up coordinated movements, to building-up the fast gear skills, to handy settlement of various motric tasks. Children love these games, are waiting them with joy, which leads to their full implication in the settlement of the tasks assigned by the educator or sports professor (Ciolcă, 2005).

From cinesitherapeuthical points of view, there are no complete studies regarding the implementation and importance of the movement games in the education and improvement of coordination, balance and stability, at the category of children. Beginning with this aspect, my wish was to highlight the importance of the preventative programs for a good growth and development of the child between 4 and 7 years old.

Conclusions

As a result of the research conducted and based on the results obtained, in the work experimental group and in the control experimental group, on the 16 subjects - preschoolers, regarding training and improvement of coordination, balance and stability, the following conclusions may be drawn:

- coordination may be trained and improved through specific exercises, as well as through appropriate movement games, fact confirmed by the results obtained by the work experimental group, with a difference of 44 points between the initial test and the final test, against the control experimental group, that was only limited to the physical activity forms ruled by the educational plan, and that obtained a small difference, meaning 9.5 points;
- regarding the balance education, we find an ascending curve of the values obtained by the work experimental group, with a positive increase of the initial values mean of 25.12, in the end reaching up to a mean of 43.12, with a difference of 28.5 points, against the control experimental group, where the difference mean is equal to 4.25 points;
- the stability followed the progressiveness curve slower, the difference here being small, but significant for this category of age;
- therefore, the movement games gave broader impact on children who are in the physical and mental development period. Beyond the satisfaction and joy, dynamic games have a significant impact on the psychomotric skills and on the traits of character, and, why not...games represent an important link in the chain of actions affecting the motive development, combining in a balanced manner the training and educational elements with the entertainment and good mood elements.

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