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Original article

THE MOTOR EVALUATION DURING SPECIFIC ACTIVITIES FOR AN EDUCATION THROUGH ADVENTURE

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Abstract

Objective. The research aimed to identify the motor benefits focusing on the functional ability developed during the attendance to a program that included activities specific for the education throughout adventure, more specifically, the camping type.

Methods. At the study took part 112 students, age between 11-14 years. The evaluation was conducted during the two activities that were representative, using the Polar M200 watch for measuring the parameters of the heart rate and the time spent on each trail.

Results. The statistic-descriptive analyses showed strong significant results for both activities and a homogeneity below 70% for the functional parameters taken into consideration. The comparative statistic between the representative's boys-girls presents significant results from a statistic point of view, for $p<0,05$, and the groups of boys registered higher values of the arithmetic mean comparing with the groups of girls.

Conclusions. The activities that try to educate throughout adventure can have objectives if we identify the motor benefits and we create programs that are in correlation with the objectives adapted for the particularities regarding the age, gender, students' preferences and are keeping up with the tendencies of modernization and of recreational activities diversity.

Key Words: education throughout adventure, motor benefits, functional parameters, recreational physical activitie

Introduction

Developing abilities that are indispensable for an adult in a rampant technological process, and assuring optimal physical conditions are the key indicators in the vast process of the education. These above mentioned, assure a proactive development for the children and teenagers, and also, the quality used to implement them can predict the health status in the following stages of life of an individual. Physical inactivity is a major risk for the public heath worldwide (World Health Organization, 2017).

The diversification and restructuring of the content in the physical education subject case, can assure the continue students' attendance to practical activities, by adapting them to all pre-existing environments and by using movement games as the only mean of organization .(Talaghir, Iconomescu, Stoica, 2018; Iconomescu, Mîndrescu, Popovici, 2018; Rus, Talaghir, Iconomescu, Petrea, 2019).

Specific non-formal education activities have gone through a vast process of modernization lately. There are new classifications, according to the environments where the activity takes place, degree of difficulty and the fun aspect involved.

The education through adventure is a type of non-formal education with positive aspects at the motor physiological and behavioural level by placing the participant in an natural, unfamiliar environment, during some activities or experiences that contain a degree of controlled risk. (Webb, 1999; Badiu, Mereuţă, Talaghir, 2000; Prouty, 2007; Ewert and Garvey, 2007; Shikuku, Helen, Gideon, 2015).

With the help of this new way of spending their free time, the participants benefit from an improvement and an extension of the physical, technical, educational, recreational and participative potential. (Badau and Badau, 2018). This type of education benefits from the advantage brought by the innovative technology which creates equipment with diverse designs, adapted to the participants' needs and to the objectives of the outdoor and indoor recreational activities. (Stoica and Badau, 2019).

The constant presence of programs containing activities specific for the education through adventure in the students' life, develops basic motor and practical skills, indicators of the motor ability and

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skills regarding coordination. Among the four functions of the education through adventure we can encounter the motor function. The systematic and methodical practise has a positive influence on the cardiovascular, respiratory and locomotor system. (Stoica, Enoiu, Badau, 2019).

The activities implemented in the programs contain physical, cognitive and emotional challenges, specially created to fulfill the set objectives (Shellman and Hill, 2017). A meta- analysis containing 255 published articles between 1976 and 2018, claims that the education through adventure has a positive influence on the physical and psychological results when it is a part of the physical education subject. (Lee and Zhang, 2019).

Regarding the physical effects registered on the participants during such programs that use the education through adventure, the studies are limited. The published studies that have tried to prove the motor benefits are based upon the paticipants' perception and not on the motor skills and abilities testing. (Goldenberget, McAvoy, Klenosky, 2005; Ewert and Sibthorp, 2014).

Engaging in different types of physical activities, perceived as recreational activities, can encourage te development of a more active lifestyle, which can be an important element in developing the concept of public health. (Hazar, Yu, Alexe, 2020).

The researches' impact in the recreational activities domain, highlights the activities specific for the education through adventure. The researchers in the domain, offers the role of an extension of the physical education subject, due to the existing benefits in the motor purview. The economic and social transformations, the high number of medical discharges for physical effort, the high number of children who have obesity problems and the creation of specific programs and adventure parks, determined us to conduct a research in order to identify the effects of the participation to a program that has such AE activities , taking into consideration the motor and functional skills and also the basic motor abilities.

The evaluation methods applied for each activity represent an innovative way of testing during these activities, specific for the education through adventure, throughout which, we wanted to identify and measure the motor benefits, focusing on the functional ability and if there are comparative differences between the boys' and the girls' groups.

Methods

The research involved 112 subjects, 56 girls and 56 boys, ages between 11 and 14, representative for 6 schools from the Galati county. The cross section was split evenly into two groups: G1= the Vth and VI th grades, G2= the VII th and VIII th grades. The program which contained the two selected activities for the research, took place between 2nd-7th of April 2018, in the Adventure Park from the Durău resort, Neamţ county.

Starting from the hypothesis that, by engaging specific means of the education through adventure the motor and functional abilities can be optimized, we measured the time spent on each trail, the heart rate parameters (minimum, medium maximum). The data were registered using a Polar M200 watch attached to the left hand of each student, used on activity mode- Other Outdoor started at the beginning of the trail and interrupted at the end of the trail. The parameters measurements took place during two activities that are part of the implemented programme, a camping type, which was put into practice throughout six days.

The first activity, Games and Adventure, implied that G1 to follow a trail of ropes at low and high height, on a length of 120m, this task having the following description: the circulation on a bridge situated at a height of approximately 0,5-4,5m and a length of approximately 50m, on a 40m distance; the circulation on boards assembled in Z shape, at a height between 4,5-6m, on a 23m distance, followed by a descending of approximately 2m, on a ladder fixated on a tree; the circulation on a V- shaped net, at a height of approximately4-6m, on a 17m distance and a 40m long zip line. The trail followed by G2 during the first activity, implied 3 games performed at a bigger height, the circulation taking place on a bridge having a ladder shape, at a height of approximately 6-8m, on a 22m distance; the circulation on a bridge created from a tree trunk, at a height between 8-10m, on a 18m distance and a zip line of a 50m length.

Both trails were completed three times by both groups. The support surface was laterally placed, on both parts, consisting of cables that ran through the entire trail.

The second activity observed during the research, Hexagon with balance games, implied getting over six interconnected balance games as following: 4 pieces of wood with an one meter length, beam of a 5m length, cable of a 5m length, parallel cables of a 5m length, tyres hanging from different heights and cable walking. The balance was created as following: from the ropes that were holding the wooden pieces, from the cable situated parallel with the beam at an 1m distance; from the cable in Z shape; from the parallel cable situated at a 2m distance from the support one; from the ropes that were supporting the tyres and from 0, 7-1m pieces of ropes displaced at an 1m distance between them. These activitie was

accessible for every subject, and it was performed three times by the G1and four times by G2.

The results of the research were processed in SPSS 24, calculating the statistic indicators: the arithmetic mean (X), standard deviation (SD), CV-coefficient of variability, t– Student test, df-degree of freedom. The bar of signification, considered relevant for the study was p<.05.

Results

The statistical analysis of the data during the Games and Adventure activities, shows that all the tests' values were significant from a statistic point of view, for p <.05. The coefficient of variability indicates a very good homogeneity for the functional parameters in both groups (G1and G2). Both groups have registered superior values of the arithmetic mean of the boys' groups rather than the girls' groups (Table 1).

Table 1 - Statistic-descriptive analysis, Games and Adventure Vth-VIIIth grades

Groups	G1				G2					
Parameters	X	SD	CV	p	X	SD	CV	p	df	eș.
Time (sec.)	6.68	1.26	18.86%	.000	12.95	3.44	26.56%	.000	27	B
	9.54	4.64	48.63%	.000	17	3.31	19.47%	.000	27	F
FC min. (p/min.)	85.14	8.94	10.5%	.000	74.43	6.57	8.82%	.000	27	B
	86.71	9.27	10.69%	.000	78.85	10.16	12.88%	.000	27	F
FC max. (p/min.)	120.86	5.45	4.5%	.000	119.57	4.03	3.37%	.000	27	B
	130	21.96	16.89%	.000	127.28	15.09	11,85%	.000	27	F
FC med. (p/min.)	103.71	5.26	5.07%	.000	99.14	3	3.02%	.000	27	B
	107.71	9.16	8.5%	.000	103.14	11.84	11.47%	.000	27	F

X- the arithmetic mean; SD- standard deviation; CV- coefficient of variability; df-degree of freedom; p- bar of signification; FC-heart rate; min-minimum, max-maximum, med-medium; p/m- pulsations/minute; B-boys; F- girls; es- sample; G1-Vth-VIth grades; G2= VIIth-VIIIth grades.

During the Hexagon with balance games, the statistical analysis of the data shows that all the obtained values within the measured parameters, were significant from a statistic standpoint for p<05. The coefficient of variability indicates a very good homogeneity within the functional parameters, therefore, at FC max and med. (G1) with values between 3-5% and between 4-8% at FC. min, max si med. (G2). The values of the arithmetic mean obtained by the boys' groups are higher than those registered by the girls' groups, G1 and G2 (Table 2)

Table 2 - Statistic-descriptive analysis, Hexagon with balance games Vth-VIIIth grades

Group	G1				G2					
Parameters	X	SD	CV	p	X	SD	CV	p	df	eș.
Time (sec.)	2.69	.61	22.67%	.000	2.59	.78	30.11%	.000	27	B
	3.82	.51	13,35%	.000	4.21	.55	13.06%	.000	27	F
FC min. (p/min.)	80.29	9.43	11.74%	.000	75.86	4.88	6.43%	.000	27	B
	80.71	11.82	14,64%	.000	80.57	6.03	7.48%	.000	27	F
FC max. (p/min.)	115.43	4.89	4.23%	.000	112.43	7.61	6.76%	.000	27	B
	114.71	5.54	4.82%	.000	123.28	7.29	5,91%	.000	27	F
FC med. (p/min.)	101.43	3.68	3,62%	.000	95.43	6.59	6.9%	.000	27	B
	100.28	5.01	4.99%	.000	106.14	5.11	4.8%	.000	27	F

X- the arithmetic mean; SD- standard deviation; CV- coefficient of variability; df-degree of freedom; p- bar of signification; FC-heart rate; min-minimum, max-maximum, med-medium; p/m- pulsations/minute; B-boys; F- girls; es- sample; G1-Vth-VIth grades; G2= VIIth-VIIIth grades.

In table 3 were statistically analyzed the data obtained during the activity Games and Adventure with one simple student test. Within the comparative analysis between the representative's boys-girls,

there were obtained significant strong results at the time parameters (0,008 for G1 and 0,001 at G2), and significant at FC max. (0,37) and FC med. (0,015) in G1. During the classes of G2, for the students from VIIth and VIIIth grades, the statistical analysis shows significant results at the FC parameters, min. (0,045) and FC max. (0,031), for $p<0.05$.

Table 3 - Statistic-descriptive analysis between boys-girls representatives, Games and Adventure Vth-VIIIth grades

Group	G1				G2					
Parameters	X	SD	t	p	X	SD	t	p	df	es.
Time-Time (sec.)	2.86	5.29	2.85	.008	-4.05	5.84	-3.67	.001	27	B-F
FC min.- FC min. (p/min.)	1.57	12.15	.68	.500	-4.42	11.12	-2.10	.045	27	B-F
FC max.- FC max. (p/min.)	-9.14	22.10	-2.18	.037	-7.71	17.89	-2.28	.031	27	B-F
FC med.- FC med. (p/min.)	-4	8.11	-2.61	.015	-4	13.25	-1.59	.122	27	B-F

X- the arithmetic mean; SD- standard deviation; Std. Error Mean-standard error mean; t- student test; df-degree of freedom; p-bar of signification; FC-heart rate; min-minimum, max-maximum, med-medium; p/m-pulsations/minute; B-boys; F- girls; es- sample; G1-Vth-VIth grades; G2= VIIth-VIIIth grades.

The statistical analysis of the data obtained during the Hexagon with balance games activity, featured in table 4 was conducted with one simple student test. Strong results were registered from a statistic standpoint at the time parameters (0,000 for both groups, grades Vth-VIIIth) FC max. and FC med. (0,000) at G2, and significant at the FC parameter min. (0,015) and FC med. (0,015) within the same group, for $p<0.05$.

Table 4 - Statistic-descriptive analysis between boys-girls representatives, Hexagon with balance games, Vth-VIIIth grades

Group	G1				G2					
Parameters	X	SD	t	p	X	SD	t	p	df	es.
Time-Time (sec.)	-1.13	.72	-8.30	.000	-1.61	.79	-10.72	.000	27	B-F
FC min.- FC min. (p/min.)	-.42	16.64	-.13	.893	-4.71	9.57	-2.60	.015	27	B-F
FC max.- FC max. (p/min.)	.71	7.47	.50	.617	-10.85	11.79	-4.87	.000	27	B-F
FC med.- FC med. (p/min.)	1.14	5.53	1.09	.284	-10.71	11	-5.15	.000	27	B-F

X- the arithmetic mean; SD- standard deviation; Std. Error Mean-standard error mean; t- student test; df-degree of freedom; p-bar of signification; FC-heart rate; mim-minimum, max-maximum, med-medium; p/m-pulsations/minute; B-boys; F- girls; es- sample; G1-Vth-VIth grades; G2= VIIth-VIIIth grades.

Discussions

The results of our research underline the strong significant differences between boys and girls in favor of the boys the time spent on the trail, or the speed of circulation, for both activities and both groups. Regarding the effort perception by the participants, we have not identify significant differences on the variation values of the heart rate between boys and girls at the Hexagon with balance games activity within Vth-VIth grades.

We owed this phenomenon to the will to succeed and to surpass the challenges, the students being able to control the functional and psychologically exciting factors. Within the VIIth-VIIIth grades, we registered significant differences at a statistical level, for all the functional parameters, as a result of the growing and motor and somatic development.

Conclusion

Identifying the activities that are a part of the children's and teenagers' recreational physical program and evaluating the installed motor benefits, represents a less researched category, by researchers at a national level.

Identifying the benefits and confirming them is a valid motif for strongly promoting this type of activity. Participating to these types of activities, specific for the education through adventure, can contribute to the decrease of inactivity and to a proactive lifestyle.

Participating to a program with activities that are specific for the education through adventure can contribute to the functional capacity development, fact proven by the statistical analysis of the obtained results. Adapting the activities and their degree of difficulty to the physical, somatic and functional particularities, can determine a development of an overall motility.

The education through adventure activities type can have objectives by identifying the motor benefits, by creating programs in correlation with the specific objectives, adapted to age, gender particularities and to students' preferences, according to the modernization tendencies and to the diversity of the recreational activities.

It is important for these types of activities and for their motor benefits to be presented to the public and to the society in order to encourage a higher degree of participation.

Combining the idea of motor development through formal activity during the physical education class with the potential that EA has, representing the non-formal education, results in a new vision upon the real dimension and the potential that needs to be exploited in the curriculum, by implementing an optional subject within all the education cycles.

Developing the proactive aspect towards the nature, maximizing the non-cognitive abilities through games, specific activities and practical courses are aspects that can be observed in the non-formal educational domain and, it could represent a real alternative for spending our free time.

The interdisciplinary use of the knowledge in the domain, together with the medical knowledge, facilitates the creation and the evaluation of activities specific for the education through adventure. Taking into consideration this aspect, the program leaders can adapt the activities according the participants', somatic and motor particularities focusing on a high quality of the recreational activity, on optimizing the state of health and on the human motor potential.

Further investigations are necessary regarding other aspects of the recreational physical activities, testing other types of activities and expanding the span of the subjects' age.

References

Badau D & Badau A, The motric, Educational, Recreational and Satisfaction Impact of Adventure Education Activities in the Urban Tourism Environment, Sustainability 10, 2018, 2106.

Badiu T, Mereuţă C, & Talaghir LG, Metodica educaţiei fizice a tinerei generaţii, Editura „Mongabit, Galaţi, 2000, p.124

Ewert A & Garvey D, Philosophy and theory of adventure education. În D. Prouty, J. Panicucci, & R. Collinson (Eds.), Adventure Education: Theory and Applications, Champaign, IL: Human Kinetics, 2007, 19-32.

Ewert A & Sibthorp RJ, Outdoor Adventure Education: Foundations, Theory, and Research, Human Kinetics, 2014, p.5.

Goldenberg M, McAvoy L & Klenosky DB, 2005, Outcomes from the components of a Outward Bound experience. The Journal of Experiential Education, 28(2), 123-146.

Hazar F, Yu JH & Alexe D I, Participation in physical activities as recreational activity, Science, Movement And Health, 2020, 20(2), 113–116.

Iconomescu TM, Mindrescu V. & Popovici I.M., 2018, A comparative study regarding secondary school students' satisfaction degree regarding the physical education class in Romanian and in Turkey, SHS 01028 – ERPA, 48.

Lee J & Zhang T, The impact of adventure education on students' learning outcomes in physical education: A systematic review. Journal of Teaching, Research, and Media in Kinesiology, 5, 2019, 23-32.

Prouty D, Introduction to adventure education, Adventure Education: Theory and Applications, Champaign, IL: Human Kinetics, 2007, 3-17.

Rus CM, Talaghir LG, Iconomescu T.M. & Petrea R.G., Curriculum Changes in Secondary School Physical Education and Sport Subject in the Romanian Education System, Revista de Cercetare si Interventie Sociala, 2019, 66, 342-363.

Shellman A & Hill E, Flourishing through Resilience: The Impact of a College Outdoor Education Program, Journal of park and recreation administration, 35, 2017, (4), 59-68.

Shikuku WO, Helen M & Gideon O, Impact of outdoor adventure education on Kenyan youth, in peace building, World Leisure Journal, 57(4), 2015, 297-305.

Stoica L & Bădău D, The Use of Polyamide Slaklines in Evaluating the Moving Speed in the Dynamic Balance and the Effort Capacity During the Education through Adventure Programs, Materiale Plastice, 2019, 56(4), 852-856.

Stoica L, Enoiu RS & Bădău D, Functions of Outdoor Adventure Education Programs, Health, Sports & Rehabilitation Medicine, 20(1), 2019, 35-38.

Talaghir LG, Iconomescu TM & Stoica L, The Sports Game –A Means of Developing Motor Skills in Secondary School. A Study on Strength and Endurance. Revista Romaneasca pentru Educatie Multidimensionala, 10(4), 2018, 228-240.

Webb D, Recreational outdoor adventure programs. In J.C. Miles & S. Priest (Eds.) Adventure Programming, State College, PA: Venture Publishing, 3-8, 1999.

World Health Organization, Physical inactivity: A global public health problem, 2017 (Retreivedfrom:http://www.who.int/dietphysicalactivity/factsheet_inactivity/en/)