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Original research article

THE INFLUENCE OF DIFFERENT CONTENT ON THE MOTOR ENGAGEMENT OF PRESCHOOLERS

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Abstract. *The goal of this work was to research the influence of athletic, gymnastics and dance content on the motor engagement of preschoolers during individual phases, as well as on the total engagement during directed motor activities. The research was realized during the first term of the 2015/2016 school year in the pre-school institution "Dečja Radost" in Svilajnac, and 60 activities of preschoolers were monitored. The time of engagement was measured by random choice of one of the preschoolers and he or she was being monitored by the measurer during the directed activity. The preschooler whose engagement was being measured did not know that he or she was the object of monitoring and measuring. Apart from the descriptive statistics, the One-way ANOVA and Tukey's HSD test were applied in the processing of the data measured in this empirical research. The parameters of the descriptive statistics indicate that the dance content influenced the biggest engagement in the preparatory and the main phase of the directed activity. The elements of athletics were more efficient in the introductory and the final phase, as well as in the total engagement. The average engagement with athletic content is 727.65, and with the dance content it is 718.70 seconds. The values of ANOVA indicate statistically significant difference for all phases in comparison to the content directed to motor activities. The general statement indicates that athletic and dance activities by their content influence more positively the total engagement of preschoolers in relation to gymnastics content.*

Key words: *athletics, gymnastics, dancing, motor engagement, directed activity.*

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INTRODUCTION

The system of preschool education and upbringing is the first level that children encounter, and that is of great importance for their growth, development and the formation of their personality and because of that it is necessary to make it available to all children. Body movement-exercises at the preschool age can have a positive influence on forming the motor behaviour of children, which is the basis for the later shaping and development of motor abilities, motor knowledge, active participation in sports, recreation and creation of an adequate capacity for different activities at an older age. Physical education as a planned and creative activity, with clearly defined goals starts in the institutionalized education of the Republic of Serbia during preschool education and it ends most often with the completion of high school. Physical education as a part of the system of physical education has the task to persuade people of the values of physical education, to accustom people to exercising and to encourage people if they exercise then to persevere (Višnjić, Miletić, & Jovanović, 2004). Simply spoken, from preschools via schools everyone should tend to naturalize physical education.

The forming of habits with regular body exercises and positive attitudes about physical education should start from the youngest age in family and kindergarten. The education of parents and teachers must be held in adequate institutions applying different content by experts.

In the entirety of the problem of the weakness of physical education, the following is most often cited: insufficiently organized and planned work in preschools, the reduced ability of teachers to realize the complex tasks of physical education and uneven, very often poor material-spatial conditions in preschools for the realization of physical education.

Directed activity in physical education of preschoolers represents a form of the organization of educational process through which the tasks of physical education are realized in the most comprehensive and most complex way (Blagajac, 1995: 112). It has influenced the shaping of the entire character of a child. Observed through Bloom's taxonomy of educational processes, physical education includes the development of all three domains (cognitive, affective and psychomotor). Apart from the aforementioned, we must not leave out the biological-anthropological and health-hygienic significance of physical exercise. The presence of directed activity from once in a week in younger group, to two times a week in the medium group and three times a week in the older group is insufficient and less than in the surrounding countries. In most documents moderate to strong physical activities are recommended from three to five times a week for 30 to 45 minutes (Strong et al., 2005) depending on age. As a contribution to this recommendation, there is the fact that physical inactivity was identified as the fourth leading risk factor of death on the global level, and it is a cause of 6% of all deaths in the world (World Health Organisation, 2010).

Daily physical exercise significantly influences the motor abilities of preschoolers. Significant differences were seen between genders in relation to motor abilities (De Privitellio, Marić, & Mijan, 2006; Cvetković, Popović, & Jakšić, 2007; Marković & Šekeljić, 2008). Certain authors in Slovenia show that there is significant differentiation of motor abilities in the motor behavior of children from the age of three, up to the age of seven (Rajtmajer & Proje, 1990; Rajtmajer, 1997). The motor abilities of preschool children depend on the time spent in preschools (Sabo, 2005). The research of Hinkley,

Crawford, Salmon, Okely, & Hesketh (2007) shows that boys are more active than girls, then that children of more active parents show more activity themselves while doing physical exercise. They also pointed out that the children that spend more time outdoors show more prominent physical activity in comparison to the children that spend most of the day indoors. Higher engagement is met later for elementary school children (Marković & Ignjatović, 2015a) and high school students (Arunović, Novković, & Tomić, 1979), as well as better sport technical knowledge (Šekeljić, Marinković, & Stamatović, 2013). Boys make 1000 steps more than girls on average (Al-Hazzaa & Al Rasheedi, 2007; Cardon & De Bourdeaudhuij, 2007; Tanaka & Tanaka, 2009). The results of the research of Ball et al., (2001) which included participants aged six to nine show that the total daily consumption of energy for boys is bigger, and it is 1.881kcal (± 271), while for girls it is 1.795 kcal (± 286).

Apart from games which represent the main device in work with preschoolers, we often apply activities with athletic, gymnastic and dance content (theme dances, melody dances, Serbian folk dances, dances of other nations and disco dances). Dance content is always accompanied by music which has positive effects and psychologically has an influence during difficult exercise (Mohammadzadeh, Tartibiyan, & Ahmadi, 2008). The positive effects of exercise accompanied by music influence maximal compensation of oxygen, and the variables of general coordination and the coordination in rhythm indicate practical application of exercise with music with the goal of proper dosage and goal achievement and physical education tasks (Alpert, Field, Goldstein, & Perry, 1990; Mandarić, 2001; Stanišić, Kostić, Uzunović, & Marković, 2008).

The idea for this work originated from Janković's research (2016) which stated that there was a statistically significant difference in complete motor engagement of the groups formed according to the content of the main part of the directed motor activities. The children were the least engaged in the main part of the activity when they practiced gymnastic content and relay games, and they made most steps when in the main part of the activities were realized with athletic, and least with gymnastic content.

This research had for its goal to evaluate the influence of athletic, gymnastic and dance content in the motor engagement of preschoolers during certain phases, as well as on the complete engagement on directed motor activities.

METHODS

Participants

The research was realized in the "Decja Radost" preschool in Svilajnac, the Republic of Serbia in the first term of the 2015/2016 school year. This institution offers a preschool education with the programme of a whole day stay and half way stay; following model A (Marković & Šekeljić, 2008). In order to determine the influence of different content on the motor engagement of children in phases and complete engagement, 20 activities were monitored with elements of athletics, where natural forms of movement prevailed, including walking, running, jumping, climbing, going through, crawling and rolling, 20 activities with the elements of gymnastics for the development of dexterity (forward roll, rolling along the body axis, bench walking, etc.) and 20 activities with dance content (theme dances, the dance accompanied by music, Serbian folk dances, dances of other nations and disco dances).

Measuring

The time of engagement was measured by the random choice of one of the children, and he or she was monitored by the invigilator during directed activity. The measurements were done during regular directed activities, which were carried out in the sports hall with the consent of the preschool's management. This was empirical research by nature, and in relation to duration it is transversal research. The chronometric method was applied, which was justified in previous researche (Arunović et al., 1979; Krsmanović, 1989; Findak, Delija, Mraković, & Metikoš, 1996; Dragić, Nikolić, Bećarević, & Veselinović, 2010; Janković, 2013). The engagement of a child was measured by ca hronometer which was activated when the child was motorically engaged during performance of the tasks given by the teacher and it was stopped when the child ceased with the activity. The results were written down in lists, especially for each part in the structure of the activity. The invigilator who participated in the data collection is a physical education teacher with previous experience in monitoring the engagement of children by chronometric method.

Statistical procedures

Apart from descriptive statistics in the processing of the data acquired during the empirical research, the One-way Anova and Tukey's HSD test were applied. The results were analyzed with the Statistical Package for the Social Science (SPSS) version 18.0.

RESULTS

By analyzing the tables we can see that the values of the duration of the engagement in exercise in phases and complete engagement are within the relatively possible and expected limits.

Table 1 Descriptive indicators for certain phases and complete engagement in activities in relation to athletic content

Phase	N	M	Min	Max	SD	Skew	Kurt
IA – Introductory phase (s)	20	152.10	70.00	205.00	48.39	-.413	-1.424
IB – Preparatory phase (s)	20	134.90	106.00	207.00	24.47	1.748	3.811
II – Main phase (s)	20	364.95	270.00	475.00	55.00	.256	-.441
III – Final phase (s)	20	75.70	36.00	139.00	27.98	.608	-.179
Total engagement – (s)	20	727.65	620.00	898.00	87.61	.674	-.947

Legend: N – number of the activity; M – arithmetic mean; Min – minimal values; Max – maximal values; SD – standard deviation; Skew – skewness; Kurt – kurtosis

Certain phases of the directed motor activity are structured with the following absolute duration: IA phase (introductory) – five minutes, IB phase (preparatory) – five minutes, the second phase (main) – fifteen minutes and the third phase (final) – five minutes. By analyzing Table 1. one can see that the complete engagement of preschoolers with the content from athletics is 727.65 seconds, with a minimal engagement of 620.00 seconds and a maximal engagement of 898.00 seconds. The inhomogeneity of the results provoked a high value of the standard deviation of 87.61. All of the results are normally distributed, with the value of skewness in the interval from –1 to +1, except for the preparatory phase

results. Kurtosis is, except for the preparatory phase in all other phases, as well as in complete engagement, less than three, which indicates that the results are homogeneous and that the curve is leptokurtic.

Table 2 Descriptive indicators for certain phases and the complete engagement in activities in relation to the gymnastics content

Phase	N	M	Min	Max	SD	Skew	Kurt
IA – Introductory phase (s)	20	109.35	59.00	178.00	32.95	.224	-.614
IB – Preparatory phase (s)	20	181.50	120.00	222.00	33.48	-.640	-.736
II – Main phase (s)	20	213.20	59.00	423.00	117.14	.365	-.699
III – Final phase (s)	20	54.70	36.00	125.00	19.55	2.703	8.865
Total engagement – (s)	20	558.00	288.00	846.00	151.87	.140	-.420

The complete engagement of the preschoolers in gymnastics content is 558.00 seconds, with a minimal engagement of 288.00 seconds and a maximal of 846.00 seconds. The big difference was conditioned by the application of additional exercises in the main phase of some activities. The inhomogeneity of the results provoked the high value of standard deviation of 151.87 for complete engagement and 117.14 for the main phase of engagement. The minimum and the maximum values are the most prominent in the final phase of the activity and with this they influenced high values of skewness and kurtosis.

Table 3 Descriptive indicators for certain phases and the complete engagement in activities in relation to dance content

Phase	N	M	Min	Max	SD	Skew	Kurt
IA – Introductory phase (s)	20	120.00	62.00	165.00	28.27	-.550	.039
IB – Preparatory phase (s)	20	158.80	95.00	244.00	42.62	.280	-.894
II – Main phase (s)	20	384.00	285.00	490.00	55.39	.260	-.493
III – Final phase (s)	20	55.90	30.00	83.00	14.45	.072	-.083
Total engagement – (s)	20	718.70	533.00	857.00	90.68	-.545	.089

The dance content also influenced a high engagement of 718.70 seconds. The content was organized in such a way and realized that the minimum and maximum values of the complete engagement were far less in comparison with the minimum and maximum values of the gymnastics content and athletic content. The homogeneity of the results influenced the values of skewness in the interval from –1 to +1, and kurtosis was for all the phases and the complete engagement less than three which indicates homogeneity of the results and a leptokurtic curve.

By the analysis of the results from the table of descriptive statistics we can see the highest engagement in the introductory phase of the activity was with the athletic content, where the frontal form of work with natural forms of movement was applied (Table 1). The longest engagement in the introductory part of the activity was during the realization of the gymnastics content activities. We can see the careful preparation of locomotor apparatus of the children, adequate exercises of shaping by the teachers (table 2.). The longest main phases on average were for the athletic content, and were 171 seconds longer than the gymnastic content phase. The children exercised most in the final phases of the directed activity, where the athletic content was planned and realized.

Table 4 The analysis of the differences of certain phases of the directed activity and the complete engagement in relation to the realized content

Phase	df	F	p
IA – Introductory phase (s)	2	7.028	.002
IB – Preparatory phase (s)	2	9.210	.000
II – Main phase (s)	2	26.523	.000
III – Final phase (s)	2	6.071	.004
Total engagement – (s)	2	13.967	.000

The values of the univariate analysis of variance indicate that in the introductory phase of the activity in relation to the content there is no statistically significant difference at the p=.002 level of statistical significance. The Tukey HSD test indicates that by comparing the arithmetic means of the introductory phases with different content, a statistically significant difference in the duration of the engagement only exists between dance and athletic content (p=.024), and gymnastics and athletic content (p=.002). A statistically significant difference does not exist between dance content and gymnastics content. In the introductory phase of the activity, a statistically significant difference was stated at the p=.000 level of statistical significance. By the use of Tukey's HSD test we determined the differences in the preparatory phase of the directed activity only between gymnastics and athletic content. The engagement in the main phase of the activity in relation to the content is at the p=.000 level of statistical significance. By the use of Tukey's HSD test a statistically significant difference was not stated only between dancing and athletic content. By the use of the univariate analysis of variance statistically significant differences were stated (p=.004) in the final phases of directed activities in relation to the content. By the use of Tukey's test a difference was not stated for the final phases, only between dance and gymnastics contents. Between the complete engagement there is a statistically significant difference at the p=.00 level of statistical significance. By multiple comparison significant differences were not stated only between dance and athletic content (p=.967).

DISCUSSION

By analyzing the average values of the introductory phase of the directed activity with the athletic content it can be stated that the utilization in relation to the absolute duration is 50.66%, for gymnastics content 36,45% and for dance content 40%. The values are identical to the results obtained by Janković (2016) in which the analysis of various kinds of activities determined that in the introductory phase the children that are most engaged are those who practice athletic exercises. As for the preparatory phase the utilization of athletic content is 44,96%, of gymnastics 60,5% and dance content 52,93%.

We can see the detailed preparation of the children's bodies when the exercises on equipment and floor are in question, where injuries can be made as a result of inadequate preparation. The utilization of the main phase of the activity in comparison to the absolute phase for dance content is 25.6%, follow by the efficiency of athletic content with an average engagement of 24.33% and the smallest engagement was determined for gymnastics content, with only 14.21%. The smallest engagement was recorded in the gymnastics content in Janković's research (2016). Athletic content with the natural forms of movement demands exercises of stretching and extension, so that the engagement in the final phase is 25.33%,

then follow dance content with the engagement of 18.63% and the smallest engagement in the final phase of the activity is in gymnastics content with only 18.63% of the time. The longest total engagement was acquired with athletic content and it is 40.42% of the total time. Almost the same results are found in school age children where the engagement during classes is much higher with athletic content in relation to classes with gymnastics content (Arunović et al., 1979). A somewhat smaller engagement of 39, 92% was determined for dance content and the smallest engagement for gymnastics content, only 31%. The positive effects of dance content in relation to moving games were determined in the research of Marković & Ignjatović (2015b), and the positive effect of dance content on the active time of exercising and motor abilities during the preschool age was indicated by Kostić, Miletić, Jocić, & Uzunović (2002).

Insufficient utilization of absolute time of directed activity which by the use of the most frequent and the most efficient content influences engagement, i.e. active time of exercise from only 37.11% can somehow be explained by the choice of work type, working method, insufficient application of methodical and organizational forms of work, a large number of children in a group, inadequate material-spatial conditions, insufficient amount of equipment and tools, and the theoretical and practical knowledge of the teachers who plan the activities. The total engagement which is in the interval from ten to twelve minutes is insufficient considering that children have one to three weeks of activity depending on their age, so that physical activity of today's children is much smaller than 50 years ago (Boreham & Riddoch, 2001).

In the documents of the National Association for Sport and Physical Education, 2013, it is recommended that a person should have at least 60 minutes, up to several hours of physical activity every day. In this way obesity is reduced, academic results are improved, children think positively about themselves, the risk of depression and stress is reduced, general quality of life is improved and children become productive and healthy members of the society. The World Health Organisation (2010) points out that children from the age of five to the age of seventeen need everyday moderate to strong activity lasting for a minimum of 60 minutes. The recommendation of the British foundation "Heart" – centre for physical activity and health is also everyday one-hour moderate to strong activity (Bull, 2010). In similar research including children with an average age of four and a half it was shown that from the planned 30 minutes, the activities last 24 minutes, and the children are motorically engaged 9,46 minutes (Ružić, Marincel, & Runjić, 2006). Boys are more active than girls (Baranowski, Thompson, Durant, Baranowski, & Puhl, 1993; Pate, Pfeiffer, Trost, Ziegler, & Dowda, 2004), although this difference is becoming smaller if only directed activity is compared, which proves that boys more often participate in intensive activities than girls (Riddoch, & Boreham, 1995). As a result, boys have to make 15.000 steps during the day, and girls 12.000 (Tudor Locke, et al., 2004). Similar results were obtained for children aged five to twelve, where percent of body fat was compared acquired by bioelectric impendence and number of steps (Duncan, Shoefield, & Duncan, 2007). By this research it was determined that boys for normal percent of body fat should make about 16.000 steps every day and girls about 13.000.

CONCLUSION

The goal of this research was to investigate the influence of athletic, gymnastics and dance content on motor engagement of preschoolers during certain phases, as well as on the total engagement on directed motor activities. 60 activities of preschool preparatory programme were studied. The parameters of descriptive statistics indicate that the dance content influenced the duration of the preparatory and the main phase of the directed activity. The elements of athletics were more efficient in the introductory and final phase as well as in the total engagement. The values of the univariate analysis of variance indicate that there are statistically significant differences for all phases and for the total engagement in relation to the realized contents of the directed motor activities. *The general statement indicates that athletic and dance* activities *with their content have a positive influence on the total engagement of preschoolers.*

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UTICAJ RAZLIČITIH SADRŽAJA NA MOTORIČKU ANGAŽOVANOST PREDŠKOLACA

Cilj rada je bio da se istraži uticaj atletskih, gimnastičkih i plesnih sadržaja na motoričku angažovanost predškolaca tokom pojedinih faza, kao i na ukupnu angažovanost na usmerenim motoričkim aktivnostima. Istraživanje je realizovano u prvom polugodištu školske 2015/2016. godine u predškolskoj ustanovi „Dečja radost" u Svilajncu. Posmatrano je 60 aktivnosti dece predškolsko-pripremnog programa. Vreme aktivnosti (angažovanosti) se merilo slučajnim izborom jednog predskolca i njegovim praćenjem od strane merioca u toku usmerene aktivnosti. Presdkolac kome se meri angažovanost nije znao da je objekat posmatranja i merenja. U obradi podataka dobijenih empirijskim istraživanjem pored deskriptivne statistike, primenjena je One-way Anova i Tukey's HSD test. Parametri deskriptivne statistike ukazuju da su plesni sadržaji uslovili najdužu angažovanost u pripremnoj i glavnoj fazi usmerene aktivnosti. Elementi atletike su bili efikasniji u uvodnoj i završnoj fazi, kao i ukupnoj angažovanosti. Prosečna anagažovanost sa atletskim sadržajima je 727.65, a sa plesnim 718.70 sekundi. Vrednosti univarijantne analize varijanse ukuzuju na statistički značajnu razliku kod svih faza u odnosu na sadržaje usmerene motoričke aktivnosti. Opšta konstatacija ukazuje da atletske i plesne aktivnosti svojim sadržajima pozitivnije utiču na ukupnu angažovanost dece predškolskog uzrasta u odnosu na gimnastičke sadržaje.

Ključne reči: *atletika, gimnastika, ples, motorička angažovanost, usmerena aktivnost.*