

Effects of Programmed Training on the Motor Skills of Female Basketball Players in School Sports Societies

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Abstract

School sports societies are organised with the goal to enable pupils to engage in their preferred sports. Also, this system is implemented in certain sports within school sports societies with the aim to facilitate better development of motor and functional abilities, and anthropometric characteristics. During training sessions of school sports societies, pupils should not be exposed to excessive training intensity. The training process should be in compliance with the principles of sports development, but also with the principles of growth and development of children and youth. The aim of this research was to determine the effects of a two-month training on the changes in motor skills in young female basketball players, members of the school sports society. The sample consisted of 10 schoolgirls, members of the school sports society at the Primary School Jabukovac. In the assessment of the effects of a two-month training, a battery of 12 tests was used to measure motor skills. Based on the obtained results it can be concluded that the two-month systematic training process in the school sports society consisting of three 45-minute sessions per week, along with regular PE lessons consisting of 2 lessons per week contributed to the transformational effects of motor skills in young female basketball players. The most significant transformations were observed in explosive strength, coordination and flexibility.

Key words: basketball; motor skills; school; schoolgirls; school sports

Introduction

Although regular physical education lessons cannot be replaced, they are seen as the foundation for the introduction into all other organizational forms of work (Findak,

Prskalo, & Babin, 2011). PE lessons are implemented in primary schools; however, they are not sufficient for optimal development of specific motor and functional abilities, nor in raising the motor skills to a high level. In order to neutralise the negative consequences of physical inactivity, it is necessary to offer pupils a range of extra-curricular and out-of-school activities. A significant number of school children are either not active members of any sports clubs or their participation is short-lasting, i.e. insufficient for it to bring about significant improvements. Specifically, the willingness of schools to meet pupils' needs for kinesiological activity is questionable, especially if only 24% of first to fourth graders actively participate in kinesiological extra-curricular activities, while as many as 64% of pupils are included in out-of-school kinesiological activities (Prskalo, 2007). The reason may partly be found in the fact that children have many school-related obligations as well as non-kinesiological extra-curricular activities. It is therefore necessary to provide quality physical education lessons in the schools, as well as a greater number of lessons per week (Milanović et al., 2009).

School sports societies in primary schools provide pupils with the optimal level of the development of individual anthropological characteristics and approach to the selected sport in terms of satisfying the desire for competition. This system is carried out with pupils in certain subsections of the school sports societies with the aim to enable better development of their motor and functional abilities. It is important that, through the work of school sports societies, talented pupils are recognised and directed to sports clubs. Creating a constant need for physical exercise, i.e. constant habit of practicing sport, may enable pupils to adopt motor and other life knowledge whose use value may significantly affect the development of functional, motor and overall human characteristics of a young person and maintain them at the high level until their later age. Therefore, it is necessary to take advantage of all the opportunities provided by the programmes of school sports societies, so that pupils might create a habit of daily exercise and engagement in sports activities throughout their life as a necessary part of their culture of living (Badrić, Prskalo, & Trklja, 2010). During their training within school sports societies, pupils should not be exposed to excessive intensity in exercise. The amount of strain needs to be in compliance with the principles of sports development, but also with the principles of growth and development in children and adolescents (Badrić, 2010). The primary objective of the training of children and youth in sports schools should not be rapid improvement in their athletic performance, but the construction of functional and motor bases for their accomplishment in the later stages of sports training (Milanović & Jukić, 1992). "Mere involvement in a competitive activity does not provide the most important aspect of participation in a school sports society, i.e. preparation. In fact the current system does not provide for the development of school sports society but only its outer form" (Prskalo & Čustonja, 2009, p. 112).

Basketball, as a game, in addition to physical contact, includes efforts such as running, jumping and quick stop, all of which require good muscular strength (Vamvakoudis, 2007). Ball games require skills that include physical, technical, mental and tactical options. For this reason, players need good physical skills to be prepared to

play defence and offence. These skills are important for basketball (Tsunawake, 2003 as cited in Cengiz, 2013). In training young female basketball players, an important area of training is increasing all motor skills, with an emphasis on agility, speed and explosive strength. It is a well-known fact that the greatest positive shift in the development of these skills is achieved in the younger age group (Ivković, 2007). In basketball, as a complex game, activities of running and jumping with the movements of the upper body and hand ball manipulation are represented. For all these reasons it is expected that basketball will affect the harmonious development of the whole body of the child, that is, it will have a significant positive effect on a wide range of abilities and traits (Granić & Krstić, 2006).

The aim of this study was to determine the effects of a two-month training on the changes in motor skills in young female basketball players within the school sports society.

Methods

Sample

The sample comprised 10 seventh and eighth grade schoolgirls attending the Primary school Jabukovac, members of the school sports society. The average age of female pupils was 14.5 years. Their average height was 164.20 ± 4.29 cm, and weight 57.00 ± 5.98 kg. Data were collected during 2007/2008 school year while the pupils participated in extra-curricular activities within the school sports society. The experimental treatment was carried out in the period between the 12 February and 15 April 2007.

Sample of Variables

For the assessment of motor skills the following variables were used: *explosive leg strength*-SKVIM (standing high jump); SKVIZ (running high jump); *explosive arm strength*-MBM (medicine ball throw); MDO30 - 30" pass; *flexibility*-MPR-sit-and-reach; *repetitive trunk strength*-MPT-sit-ups 60"; *speed-strength*-MVS20 (sprint 20m high start); *agility*-KUS-side steps; MSBL4X5-running without the ball; MSSL4X5-running with the ball; *coordination*-MSVLR slalom dribble; MSLBL slalom without the ball. A more detailed description of the tests may be found in Metikoš et al. (1989), Milanović and Fattorini (1997), Findak et al. (1996), Metikoš et al. (2003), Milanović and Fattorini (1997).

The Programme of the Experimental Procedure

The total volume of exercise lasted eight weeks, in the course of which the weekly strain during training cycle amounted to 3x45 minutes. A total of 24 training sessions were held and two control matches were played. The programme of training cycles included: the basic elements of basketball techniques: basic basketball posture, techniques of movement without the ball, dribbling, passing and catching the ball, turns, jumps and attempting a shot at the basket while stationary or while moving. Also, the training programme included individual and team tactics of defence and offence.

The training programme included the development of motor and functional abilities, which primarily affected the development of basic motor skills with the extent of 75%, and specific motor abilities with the extent of 25%. The training was designed so that the primary influence is on the development of coordination, explosive strength and speed.

Data Processing Methods

The basic descriptive statistical parameters were calculated for all variables: arithmetic mean (M), standard deviation (SD), and minimum (min.) and maximum (max.) value. Normality of distribution was determined by the Kolmogorov-Smirnov test (KS test). In order to determine the statistical significance of the difference between the initial and final measurement Student's t-test for paired samples was applied. The obtained test results were analyzed using the statistical package Statistica for Windows, version 7.0.

Results

The obtained results for the measurements of the motor skills of female pupils who participated in the training process within the school sports society are shown in Tables 1 and 2.

Table 1

Descriptive statistical parameters obtained during the initial measurement

	N	M	SD	min.	max.	K-S p
SKVIM	10	34.60	6.36	22.00	43.00	p > .20
SKVIZ	10	37.10	7.40	22.00	46.00	p > .20
MBM	10	836.40	89.44	697.00	987.00	p > .20
MPR	10	76.20	9.35	60.00	89.00	p > .20
MPT	10	38.90	7.91	27.00	51.00	p > .20
KUS	10	10.73	0.81	9.55	12.07	p > .20
MVS20	10	4.24	0.34	3.63	4.61	p > .20
MDO30	10	30.10	3.00	24.00	35.00	p > .20
MTBL4X5	10	6.80	0.38	5.97	7.25	p > .20
MTSL4X5	10	7.46	0.34	6.96	8.09	p > .20
MSVLR	10	9.93	0.58	9.32	11.14	p > .20
MSLBL	10	8.59	0.48	7.70	9.19	p > .20

M-mean; N-number of respondents; SD-standard deviation, min.-minimum score; max. maximum score; K-S = normality of distribution; SKVIM- standing high jump; SKVIZ- running high jump; MBM medicine ball throw; MPR- sit-and-reach; MPT- sit-ups 60"; KUS-side steps; MVS20- sprint 20m high start; MDO30 30" pass; MSBL4X5- running without the ball; MSSL4X5-running with the ball; MSVLR slalom dribble; MSLBL-slalom without the ball

The results in Table 1 show the descriptive statistical parameters obtained during the initial measurement of female pupils' motor abilities. Normality of distribution determined by the Kolmogorov-Smirnov test shows that the distribution of the results does not deviate significantly from the normal distribution.

Table 2

Descriptive statistical parameters obtained during the final measurement

	N	M	SD	min.	max.	K-S p
SKVIM	10	37.40	5.83	29.00	47.00	p > .20
SKVIZ	10	39.80	6.53	31.00	50.00	p > .20
MBM	10	801.40	69.38	691.00	874.00	p > .20
MPR	10	80.00	8.64	67.00	94.00	p > .20
MPT	10	40.20	8.98	28.00	52.00	p > .20
KUS	10	10.34	0.83	9.43	12.14	p > .20
MVS20	10	4.03	0.26	3.56	4.39	p > .20
MDO30	10	31.90	2.73	28.00	37.00	p > .20
MTBL4X5	10	7.19	0.60	6.18	8.45	p > .20
MTSL4X5	10	7.77	0.51	7.03	8.48	p > .20
MSVLR	10	9.55	0.91	8.83	11.34	p > .20
MSLBL	10	8.46	0.65	7.62	9.87	p > .20

M-mean; N-number of respondents; SD-standard deviation, min.-minimum score; max. maximum score; K-S = normality of distribution; SKVIM- standing high jump; SKVIZ- running high jump; MBM medicine ball throw; MPR- sit-and-reach; MPT- sit-ups 60°; KUS-side steps; MVS20- sprint 20m high start; MDO30 30° pass; MSBL4X5- running without the ball; MSSL4X5- running with the ball; MSVLR slalom dribble; MSLBL- slalom without the ball

Table 2 shows the results of the descriptive statistical parameters of female pupils' motor abilities obtained during the final measurement. Kolmogorov-Smirnov test shows that the distribution of the results does not deviate significantly from the normal distribution.

Table 3

T-test results for paired samples between the initial and final measurements

	N	M-I	M-F	M I-F	p-level
SKVIM	10	34.60	37.40	2.8	0.00
SKVIZ	10	37.10	39.80	2.7	0.03
MBM	10	836.40	801.40	-35	0.16
MPR	10	76.20	80.00	3.8	0.00
MPT	10	38.90	40.20	1.3	0.22
KUS	10	10.73	10.34	0.39	0.16
MVS20	10	4.24	4.03	0.22	0.01
MDO30	10	30.10	31.90	1.80	0.05
MTBL4X5	10	6.80	7.19	-0.39	0.02
MTSL4X5	10	7.46	7.77	-0.31	0.01
MSVL	10	9.93	9.55	0.39	0.04
MSLBL	10	8.59	8.46	0.13	0.28

M-I-arithmetic mean initially; N-number of respondents; M-F-arithmetic mean finally; M-I-F-the difference between arithmetic means obtained during initial and final measurements; P-level-level significance of t-test; SKVIM- standing high jump; SKVIZ-running high jump; MBM medicine ball throw; MPR- sit-and-reach; MPT- sit-ups 60°; KUS-side steps; MVS20- sprint 20m high start; MDO30 30° pass; MSBL4X5- running without the ball; MSSL4X5- running with the ball; MSVLR slalom dribble; MSLBL- slalom without the ball

Results in Table 3 show the differences between the first and second measurements in young female basketball players. The analysis of the results shows that schoolgirls' results in the final measurement, in almost all variables, were numerically better than in the initial measurement, except for the variables running without the ball (MTBL 4x5), and running with the ball (MTSL 4x5). These two variables were used to assess the agility of respondents. T-test for paired samples showed that the results were significantly improved in the variables standing high jump (SKVIM), running high jump (SKVIZ), sit-and-reach (MPR), sprint 20 meters high start (MVS20), slalom dribble (MSVL). Significantly lower results were obtained for the variables 4x5 meters running without the ball (MSTL 4x5), and 4x5 meters running with the ball (MTSL 4x5).

Discussion

Research conducted by Badrić (2010), Borčić et al. (2005), Ivković (2007), Ohnjec et al. (2005), Kuleš et al. (2001), Milanović et al. (1994) and Zukolo (2007) engaged in the analysis of the effects of the influence of programmed training process in primary school pupils. For a successful transformation of anthropological characteristics it is necessary to achieve quality planning and programming of the training process, and select the most optimal methods and methodological procedures that will enable the achievement of the research aim.

The analysis of the initial and final measurement in this research has confirmed that the 8-weeks training process has had an impact on the statistically significant changes in the motor skills of the schoolgirls who were engaged in additional extra-curricular activities in school sports society. Similar results were found in Kiliñç (2008), Zukolo (2007), Milanović et al. (1994) and Blašković et al. (1993).

Results of the final measurement show that girls have made the most progress in the tests for the assessment of explosive strength, coordination and flexibility, but also that they have had significantly lower results in the area of agility. Research results (Fort et al., 2012; Santos & Janeira, 2012) showed that after 10 weeks of training the biggest changes were related to the increase in the explosive strength in young basketball players. In general, the effects of the implemented training programme have contributed to the development of the tested motor skills in schoolgirls. Those girls who had additional training in the school sports society three times a week and also attended regular physical education lessons, achieved statistically significant improvement in some motor skills. Of the 12 variables tested for the evaluation of motor skills significant progress was recorded for five variables, while in five other variables there were no significant changes.

These results show that additional involvement in a kinesiology activity, in this case basketball, in addition to regular PE classes, which are the foundation of all organizational forms of work in this area, provides significant transformational effects. In this way the value of sport is affirmed in its best form, i.e. preparation. Kinesiology content is again presented as a powerful generator of the adaptability of a human as a

self-perfecting system. In this case it is school sport which may take a significant role especially considering the trends of decrease in the standard of living. School sports is for a significant section of the population the only choice and the society should take its share of responsibility to make exercise accessible to every child, regardless of the financial status of the parents.

Conclusion

Based on the obtained results it can be concluded that the two-month systematic exercise within the school sports society taking place three times a week for 45 minutes, along with regular 2 physical education lessons per week, did contribute to the transformational effects of motor skills in young basketball players. The biggest changes were achieved in explosive strength, coordination and flexibility.

These facts may lead to the conclusion that the minimum weekly increase in physical activity can produce significant changes in the level of motor skills in 14 year old girls. Such concept of physical exercise in school sports society in addition to regular PE lessons has positive effects on the pupils' anthropological status and can meet certain guidelines regarding the need for daily exercise for children and youth. Lack of research may be reflected in a very short period of time that in some future research studies should be extended to six to nine months (roughly the period of one school year). Over a longer period of time there would certainly be significant changes in a greater number of motor skills. In addition, the battery of tests used in the study should be validated so that the introduction of new tests may provide even more relevant data in this research area.

There is a fairly small number of research studies in the field of school sport especially when the importance of the contribution of this extra-curricular activity is considered. Increase in the number of research studies might yield more relevant results, which would enable more effective educational impact on pupils in terms of the efficiency of daily physical activity on their health.

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Učinci programiranog treninga na motoričke sposobnosti košarkašica u školskom sportskom društvu

Sažetak

Rad u školskim sportskim društvima zamišljen je tako da zainteresiranim učenicima omogući bavljenje odabranim sportom. Također, takav sustav rada provodi se s učenicima u određenim sekcijama školskih sportskih društava s ciljem što kvalitetnijeg razvoja motoričkih i funkcionalnih sposobnosti, kao i antropometrijskih karakteristika. Učenici u treninzima, koji se provode u školskim sportskim društvima, ne smiju biti izloženi prevelikom intenzitetu rada. Rad mora biti usklađen sa zakonitostima sportskog razvoja, ali i sa zakonitostima rasta i razvoja djece i mladih. Cilj ovog istraživanja jest utvrđivanje učinaka dvomjesečnog treninga na promjene u motoričkim sposobnostima kod mladih košarkašica u okviru školskog sportskog društva. Uzorak ispitanika činilo je 10 učenica članica školskog sportskog društva Osnovne škole Jabukovac. Za procjenu učinaka dvomjesečnog treninga korišten je uzorak od 12 testova za mjerenje motoričkih sposobnosti. Na temelju dobivenih rezultata može se zaključiti da je dvomjesečni sustavni rad u školskom sportskom društvu (3 puta tjedno po 45 minuta), zajedno s redovitom nastavom Tjelesne i zdravstvene kulture (2 školska sata tjedno), pridonio transformacijskim efektima u motoričkim sposobnostima kod mladih košarkašica. Najveće promjene ostvarene su u eksplozivnoj snazi, koordinaciji i fleksibilnosti.

Ključne riječi: košarka; motoričke sposobnosti; škola; školski sport; učenice.