Middle-East Journal of Scientific Research 13 (11): 1526-1532, 2013
ISSN 1990-9233
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DOI: 10.5829/idosi.mejsr.2013.13.11.450

The Effect of Four Motor Programs on Motor Proficiency in 7-9 Years Old Boys

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Abstract: The purpose of this study was to investigate the effects of four motor program, the physical activity interested of parents (gymnastics), the physical activity interested of children (soccer), current physical activity program in school and school Games; on motor proficiency in seven to nine-year-old boys. 120 subjects of seven to nine-year-old boys selected randomly by a personal information questionnaire. After pretest by Bruininks-Oseretsky Test of Motor Proficiency (BOT2), subjects were divided by random matching into four groups. The first group performed physical activity interested of parents (gymnastics), the second group performed physical activity interested of children (soccer), third group performed current physical activity program in school and the fourth group performed school Games. After 4 weeks and 3 sessions per week and 90 minutes each session, they participated in post test. Data were analyzed by parametric tests, such as T-dependent test for within group mean variables and between four groups from one-way analysis of variance test (ANOVA) with Tukey post hoc test. Data analysis software was Statistical SPSS16. The results of the study showed that school games with mean difference in fine motor skills($p<0.001$) and also with mean difference in gross motor skills($p=0.002$) and mean difference in motor proficiency ($p=0.002$) sinnificantly are more effective than current program in schools. After that Gymnastics and soccer programs are effective. The School games is appropriate for development of motor proficiency.

Key word: Motor Proficiency · Fine motor skill · Gross motor skill · School Games · Gymnastics · Soccer · Current program in schools

INTRODUCTION

Motor proficiency involves two separate and distinct components: motor abilities and motor skills. Motor abilities are typically defined as underlying capabilities which are relatively stable and not easily improved upon through practice [1]. Although abilities can be shaped during growth and development, they are also considered to have a genetic basis. On the other hand, motor skills are typically thought to be modifiable through practice or experience and generally consist of a few motor abilities [1]. It has been suggested that motor skills are especially likely to change and develop during preadolescence and may define a critical learning phase for such skills [2].

Motor skills are also referred to as fundamental movement skills or childhood movement skills. Both components of motor proficiency consist of gross motor skills and fine motor skills. Most researchers are interested in motor skills in relation to motor proficiency because intervention programs are not likely to change motor abilities, but may have a significant effect on the development and maintenance of motor skills. There appears to be benefits and consequences associated with high motor proficiency and low motor proficiency such as levels of participation in physical activity and the development of different body compositions.

The early experience in childhood is specially important for development of children' motor skills [3].

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Although the development of motor skills with different ratios brought about heredity and environment, but one of the most important environmental factors in the development of skills,is quality of life during the critical early years of childhood. One of the factors that plays an important role in increasing training opportunities for motor skills and movement concepts is Physical activities and Games. The role of Games and physical activity on physical and motor development, cognitive and emotional development seem to Games can be considered as effective factor for training programs [4]. On the other hand, the acquisition of motor skills during physical education program is on target historically [5]. The researchers believed that motor skills and daily physical activity during childhood and adolescence are related to each other [6]. Yet our knowledge about the development of motor skills in children and how they relate to different types of physical activity in school is low [7].

Many studies have used self-report measures and, until recently, is intended for elementary school students are unreliable [8]. Because children are likely in many activities, including motor skills as part of their daily physical activity is involved, this measure should be valid for such activities [9]. Observational methods may be a solution for accurate measurement of free play activities for children because they can measure the quality of children's behavior [10]. Although direct observation of individuals in large population studies because of cost, is not practical, but it can be a useful measure for documenting patterns of activity seen in [11]. The other method is a same and steady program for all children. The school Games can be one of this same and steady program for elementary school students. The school Games can be considered as the early motor experience in childhood that is specially important for development of children' motor skills and children enjoy it. Moreover, the motivation of school Games is inherent and intrinsic. School games often rely on mobility. The game also includes acts such as running, jumping and so on, this acts can increase the skills and experience of children [12].

In fact, few studies have examined the relationship between motor proficiency and physical activity in school children and most of them have anticipated the level of physical activity for children based on their level of motor skill. Butcher and Eaton (1989) found that the activities of daily free play indoors in kindergarten of children 5 years old, with motor skills, a positively with running and negatively with balance and fine motor skills were related [13]. Fisher and *et al.* (2005) were observed that between the physical education program and development of motor skills were significant but weak cross-sectional relationship in kindergarten children, particularly children who have more time in moderate physical activity to severe, were more willing to spend their times in physical education program [14].

In another study, Akbari and *et al.* (2008) assessed the effect of Traditional games in Fundamental motor skill development in 7-9 year-old boys. The results showed that Traditional games with mean difference in fundamental motor skill development and also with mean difference in locomotor and mean difference in object control skill development significantly are more effective then daily activities [15].

Lisa Barnett and *et al.* (2009) research on the subject, "motor proficiency in childhood predecting physical activity in adolescence". Results showed that children's proficiency in object control, is likely to lead to more activity in adolescence period and concluded that the development of motor skills should be a key strategy in childhood interventions, physical activity may improve long-term [16].

The purpose of this study was to examine the effect of four motor programs on motor proficiency in 9-7 year old boys and compare the physical activity interested of parents (gymnastics), the physical activity interested of children(soccer), current physical activity program in school and school Games in motor proficiency, gross and fine motor skills.

MATERIALS AND METHODS

Setting and Participations: This study was conducted in Qom, Iran during 2011-2012. The study took place in elementary schools in a middle class that were boys 7-9 years old. 1000 children participated in elementary study and then they were homogenized in demographic characters (i.e. social, economic, cultural characters and live environment). From homogenized subjects, 120 subjects were randomly selected. In a pretest, 30 subjects were allocated by random matching to the each groups,the physical activity interested of parents (gymnastics), the physical activity interested of children (soccer), current and usual physical activity program in school (contorol group) and school Games (Table 1).

Table 1: General Characters

	Age		I.Q		weight		Hight	
Groups	X	SD	X	SD	X	SD	X	SD
School games	8.1	0.3	110.8	1.4	25.9	3.1	130.7	3.1
soccer	8.1	0.4	110.1	1.5	24.5	2.7	129.7	2.7
gymnastics	8.2	0.3	109.3	1.3	26	2.8	130.3	3.6
current program	8.0	0.3	109.8	1.6	26.2	2.4	129.1	3.6

Instrumentation: The test of Bruininks-Oseretsky Test of Motor Proficiency was selected for the study. The Bruininks-Oseretsky Test of Motor Pro?ciency-Short Form (BOTMP) was then used to assess children's motor ability. The short form has been validated against the full scale and consists of 14 items taken from the 8 subtests that correlate highly with the subtest score and the total score. The 8 subtests assess gross motor development, including running speed and agility, balance, bilateral coordination and strength; gross and ?ne motor development, including upper limb coordination; and ?ne motor development, including response speed, visual-motor control and upper-limb speed and dexterity. A total standard score, adjusted for child age, was used to interpret test performance. The BOTMP is a standardized, product-oriented assessment commonly used in the assessment of motor abilities in children.

The Bruininks-Oseretsky Test was administered one week prior to and following the instructional program to four groups.

Intervention Program: The intervention program was an four-week gymnastics program, soccer program, usual physical activity program,school Games program. The length of each session was 90 minutes. Session took place three days per week according to specific lesson plan. The gymnastics, soccer and school Games programs consisted of three sections: 1) warming up 2) main program for example School Games 3) cool down.

Procedures: This study has been confirmed by research council Department of Physical Education and Sport Sciences, Shahid Beheshti University, Tehran, IR Iran. This study utilized a pretest and post test applying quasiexperimental design.

Statistical Methods: The data were analyzed using descriptive analysis and inferential statistics. Variance Analyze of Repeated Measures was utilized to determine whether significant differences existed in gross motor skills, fine motor skills and motor proficiency for boys aged 7-9 years between the four groups. T-dependent test to analyze within group mean variables and between group analysis four groups of one-way analysis of variance test (ANOVA) with Tukey post hoc test was used to determine existence of differences in skills.

Software SPSS (ver 16) was employed to analyze data. $P<0.05$ was considered significant. The study protocol was approved by the Ethics Committee of Department of Physical Education and Sport Sciences, Shahid Beheshti University.

RESULTS

Descriptive analysis of data showned that the mean (SD) age of the gymnastics program, soccer program, usual physical activity program,school Games program groups were 8.2, 8.1, 8.1 and 8.2 years.

The mean (SD) weight of the gymnastics program, soccer program, usual physical activity program, school Games program groups were 26, 24.5, 26.2 and 25.9 Kg.

The mean (SD) height of the gymnastics program, soccer program, usual physical activity program, school Games program groups were 130.3, 129.7, 129.1 and 130.7 centimeters(cm).

The results illustrates the results testing effect of the gymnastics program, soccer program, usual physical activity program,school Games program on fine motor skills. Variance analyze of repeated measures indicated a significant difference in fine motor skills, effects of industrial program [$F(29)= 26.02, p<0.01$]. The interaction between industrial program and repeated measures were significant [$F(2.36)= 73.07, p<0.05$] (Figure 1).

The results illustrates the results testing effect of the gymnastics program, soccer program, usual physical activity program,school Games program on gross motor skills. Variance analyze of repeated measures indicated a significant difference in gross motor skills, effects of industrial program [$F(1.36)= 26.02, p<0.05$]. The interaction between industrial program and repeated measures were significant [$F(2.36)= 73.07, p<0.05$] (Figure 2).

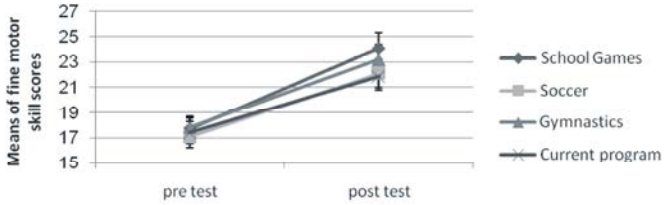

Fig. 1: The effect of the gymnastics program, soccer program, usual physical activity program,school Games program on fine motor skill

Results of Tokey post hoc indicated that School Games with mean difference 2.23 were more effective then Current program group on fine motor skills ($p< 0.001$).

Results of Tokey post hoc indicated that School Games with mean difference 2.00 were more effective then soccer program group on fine motor skills ($p< 0.001$).

Results of Tokey post hoc indicated that soccer program with mean difference 1.10 were more effective then Gymnastics program group on fine motor skills ($p< 0.03$).

Results of Tokey post hoc indicated that Gymnastics program with mean difference 1.33 were more effective then Current program group on fine motor skills ($p< 0.005$).

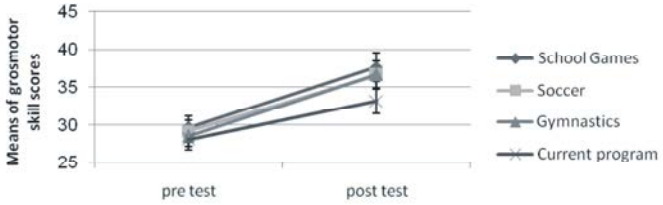

Fig. 2: The effect of the gymnastics program, soccer program, usual physical activity program,school Games program on gross motor skill

Results of Tokey post hoc indicated that School Games with mean difference 4.50 were more effective then Current program group on gross motor skills ($p< 0.001$).

Results of Tokey post hoc indicated that soccer program with mean difference 3.46 were more effective then Current program group on fine motor skills ($p< 0.001$).

Results of Tokey post hoc indicated that Gymnastics program with mean difference 3.53 were more effective then Current program group on fine motor skills ($p< 0.001$).

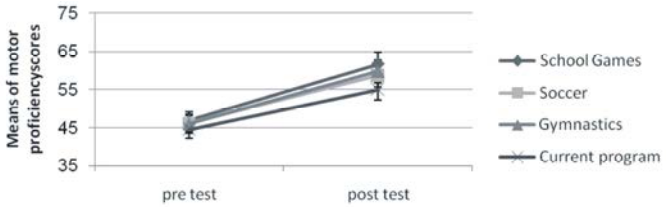

Fig. 3: The effect of the gymnastics program, soccer program, usual physical activity program,school Games program on motor proficiency

Results of Tokey post hoc indicated that School Games with mean difference 3.03 were more effective then soccer program group on fine motor skills ($p< 0.001$).

Results of Tokey post hoc indicated that School Games with mean difference 1.86 were more effective then Gymnastics program group on fine motor skills ($p< 0.02$).

Results of Tokey post hoc indicated that School Games with mean difference 6.73 were more effective then Current program group on fine motor skills ($p< 0.001$).

Results of Tokey post hoc indicated that soccer program with mean difference 3.70 were more effective then Current program group on fine motor skills ($p< 0.001$).

Results of Tokey post hoc indicated that Gymnastics program with mean difference 4.86 were more effective then Current program group on fine motor skills ($p< 0.001$).

The results illustrates the results testing effect of the gymnastics program, soccer program, usual physical activity program,school Games program on motor proficiency. Variance analyze of repeated measures indicated a significant difference in motor proficiency, effects of industrial program [$F(1.36)= 26.02, p<0.05$]. The interaction between industrial program and repeated measures were significant [$F(2.36)= 73.07, p<0.05$] (Figure 3).

DISCUSSION

The finding of this study demonstrate that school Games program is more effective than current program in physical activity class in order to develop fine and gross motor skills and motor proficirncy. This study found that motor proficiency can be influenced by an appropriate movement program.

The literature indicates that children develop motor proficiency through interaction with the enviroment. Theorists in the 1980s proposed that motor skills could be improved through practice, learning and enviromental interaction, which promote the integration of the identified sequential maturational stages of motor development [17]. The school games program components that may have contributed to benefical effects on motor proficiency include: (a) a curriculum that is made of multiple-skill practice trail in each lesson, (b)appropriate opportunity for skill learning.

Although it is commonly believed that children automatically acquire motor skills as their bodies develop but scientists believe now that enviromental conditions are effective on motor skill development. Enviromental conditions that include opportunities for practice, encouragment and instruction are crucial to the development of mature patterns of movement and motor skills.

Children should have sufficient time to practice the motor skills. Practice opportunity are limited by lack of facilities, equipments and time. Not only buying the necessary facilities and equipments for children is much expensive, but also there are not sufficient and suitable spaces for being active children. Time may be the most important factor; many children do not have enough time to develop their motor skills because their days are filled with computer games, watching TV, doing homework and going to school leaves no time for physical activity. Sufficient equipments, facilities and time are critical for developing motor proficiency [15].

Parents and physical education teachers, who are not able to provide opportunities for motor proficiency, often limit children's developmental potentials and in the end, children may fail in sports skills [18].

For performing the school games many types of equipment are not required and providing necessary equipments for carrying out these games is very convenient. Therefore some of the problems which were mentioned above due to the insufficient equipments can be omitted.

Practice opportunities are not solely responsible for developing motor skills. For the vast majority of children, developmentally appropriate instruction and program are essential [17]. Quality program has special role in developing motor proficiency. Ashy, Lee and Landin have suggested that practicing skills using correct technique is more important than the overall number of practice attempts [19]. A program that includes an extensive range of skills that can motivate children for the physical activity can be effective for boosting quality instruction. Games are pleasure activities and diverse. School games are diverse and culturally important. Required skills of these games are well-matched with motor skills and motor proficiency. In school games as motor experiences, there are all kinds of fine and gross motor skills (such as gallop, hop, slide, jump, catch, throw, kick, dribble and so on). But in current program in sport class in schools, children a few skills; they just perform unskilful and unuseful games such as running all children toward a ball. Thus, their skills do not have a little change to develop. In this group, children often do computer games; these games make children to become immobile and do not improve thier movement skills.

Also participating in Gymnastics program caused children to development in motor proficiency, the reason of this effect can be concered to acording to Gallahou suggested different levels of Gymnastics skills that including body control(stability and transfer) and balance and transfering of body weight, caused to increasing endurance and muscular power, that flying of body is in company with coordinating, timing and speed of movement, that existed in Gymnastics programs, that effected directly and undirectly on components of gross motor skill and motor proficiency [18].

Brian and *et al.* (2006) suggested that Other possible mediators of the relationship between motor pro?ciency and physical activity could be neurologic or physiologic in nature. Coordinated movement requires biomechanical and neuro-muscular systems that provide activation, sequencing, timing and scaling of muscle activity.

Children with greater motor pro?ciency may, therefore, have more opportunities for and choose to participate in more var ied physical activities, because they are better at activating and sequencing movement patterns. More efficient movement patterns may also result in less energy expenditure and lower levels of fatigue that may consequently lead to greater amounts and intensity of physical activity. Additional research is needed to more fully understand the psychosocial and neurophysiological mechanisms that may explain the association between physical activity and motor abilities [2].

CONCLUSION

The finding of this study support the notion that motor proficiency are developed and learnt through practice and instruction. The children in the current program in sport class in schools made little improvment in their motor proficiency, they only improve some gross motor skills such as runing, kicking and throwing, but they did not develop others gross skills and fine skills. These findings have applied implications in elementary school physical education programs.

ACKNOWLEDGEMENT

The authors gratelly acknowledge the support of this work from Department of Physical Education and sport sciences of shahid beheshti university. They also wish to thank the teachers and children who helped us in this project.

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