

## The Effect of Traditional Games in Fundamental Motor Skill Development in 7-9 Year-Old Boys

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Received: Oct 18, 2008; Final Revision: Jan 14, 2009; Accepted: Feb 03, 2009

### Abstract

**Objective:** The purpose of this study was to investigate the effect of traditional games on fundamental motor skills in seven to nine-year-old boys.

**Methods:** Forty subjects of seven to nine-year-old boys selected randomly by a personal information questionnaire. After pretest by Test of Gross Motor Development- edition 2 (TGMD-2), gross motor skill, locomotor and object control motor skills, subjects were divided by random matching into two groups. The first group performed traditional games and the second group performed daily activities. Then children in first group played traditional game at 24 sessions. After 12 and 24 sessions, traditional game and daily activity groups participated in the mid and post tests. Data were analyzed by Variance Analyze of Repeated Measures.

**Findings** The results showed that traditional games with mean difference in fundamental motor skill development (17.12,  $P<0.001$ ), and also with mean difference in locomotor (2.23,  $P=0.002$ ), and mean difference) in object control skill development (2.27,  $P=0.002$ ) significantly are more effective than daily activities.

**Conclusion:** Traditional game program is appropriate for a fundamental motor skill development.

*Iranian Journal of Pediatrics, Volume 19 (Number 2), June 2009, Pages: 123-129*

**Key Words:** Motor development; Gross motor skill; Locomotor skill; Object control skill; Traditional games; Daily activities; TGMD-2

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## Introduction

The unique contribution of children's physical education is in the area of movement skill acquisition. The term "movement skill" refers to a series of movements performed with accuracy and precision; a movement skill may be a fundamental movement skill or a specialized movement skill [1]. Fundamental motor skills include manipulative, locomotor, and stability movement skills. These skills are commonly considered to be the building blocks to more advanced movement skills and specific sport skills [1,2].

Fundamental motor skills help children control their bodies, manipulate their environment, and form complex skills and movement patterns involved in sports and other recreational activities [2,3]. Failure to develop and refine fundamental motor skills during the crucial preschool and elementary school years often leads children to frustration and failure to develop specialized movements during adolescence and adulthood [1]. That is, poor performance in fundamental motor skills may jeopardize future physical activities. Thus, fundamental motor skills should be the major focus of primary physical education.

Fundamental motor skills do not simply develop as a result of age [2]; that is, children cannot rely solely on maturation to reach the mature stage in their fundamental movement abilities. Environmental conditions that include opportunities for practice, encouragement, and instruction are crucial to the development of fundamental movement[4]. Therefore, they must be instructed and practiced.

There is an emerging literature base to show positive effects of early motor skill programs on motor skill development for children[5-8] including those who are at risk[9,10]. While literature suggests different instructional programs, play can be proposed as an approach for movement skill instruction; it is the primary mode by which children learn about their bodies and movement capabilities. It also serves as an important facilitator of cognitive and affective growth in young children as well as an important means of developing both fine and gross motor skills.

Traditional games are games that historically were current in the vast country of Iran; these games were fit with special whether and cultures of regions. Traditional games have humanity and cultural values, beliefs translate by these from one lineage to other. These games were forgotten as a result of industrialization in recent years.

The purpose of this study was (a) to examine the influence of an 8 week traditional game program in fundamental motor skill development (object control and locomotor skills) in 7-9 year-old boys, (b) to compare effective traditional games with daily activities on fundamental, object control and locomotor skills.

## Subjects and Methods

**Setting and participants:** This study was conducted in Semnan, Iran during 2006-2007. 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, 40 subjects were randomly selected. In a pretest, 20 subjects were allocated by random matching to traditional game program, while others (comparison group) had usual physical activity. The mean age of the traditional game group was seven years and eight months and that of the comparison group was eight years and two months.

**Instrumentation:** The test of Gross Motor Development -edition 2 (EGMD-2)[11] was selected for the study. The TGMD-2 evaluated performance of six locomotor (i.e., run, gallop, leap, jump, hop, slide) and six object control (throw, catch, kick, strike, dribble, roll) skills for children aged 3 to 10 years.

The TGMD-2 was administered one week prior to and following the instructional program to both traditional game and comparison groups.

**Intervention program:** The intervention program was an eight-week traditional game program. The length of each session was 60 minutes. Sessions took place three days per week according to specific lesson plan. The traditional game program consisted of three sections: 1) warming up with usage of simple games, 2) traditional games 3) cool down.

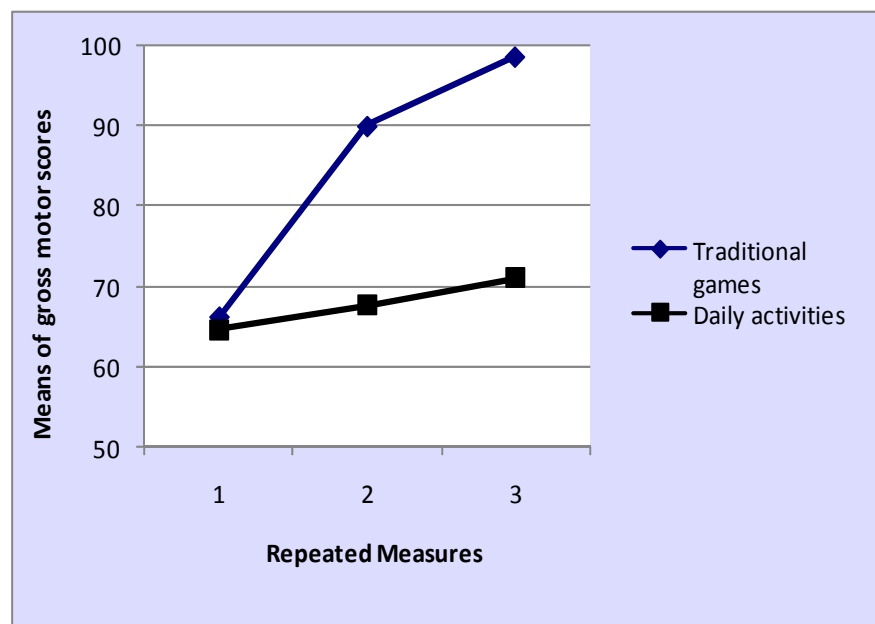
**Procedures:** This study has been confirmed by research council of Tehran University of Medical Sciences. This study utilized a pretest, middle and post tests applying quasi-experimental design.

**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, object control, and locomotor skills for boys aged 7-9 years between the two groups. Least significant difference (LSD) post hoc test was used to determine existence of differences in skills within and between the two groups. Software SPSS (ver 11.5) was employed to analyze data.  $P < 0.05$  was considered significant. The study protocol was approved by the Ethics Committee of Tehran University of Medical Sciences.

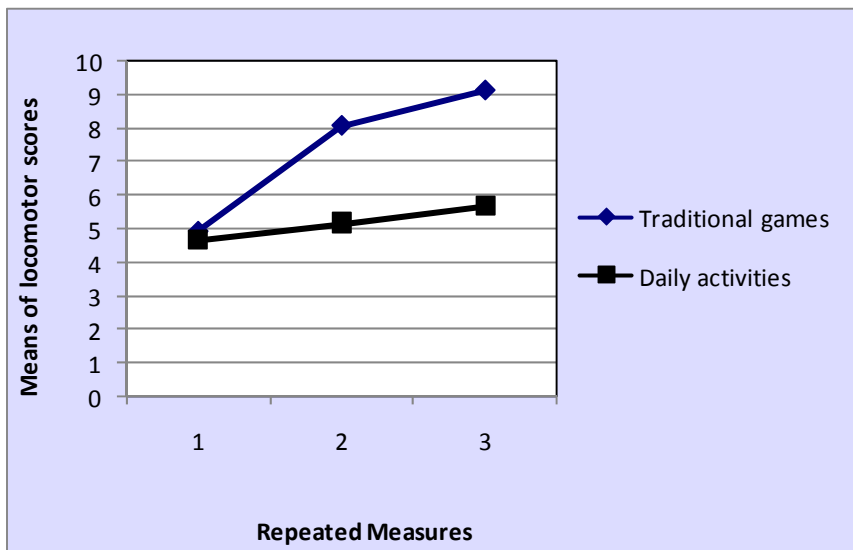
## Findings

Descriptive analysis of data showed that the mean (SD) age of the traditional game group was 7.8 ( $\pm 0.99$ ) years and the mean age of the comparison group was 8.2 ( $\pm 0.99$ ) years, mean difference between the two groups being 3.5 months. The mean (SD) weight of the traditional game group was 24.8 ( $\pm 0.51$ ) Kg and the mean weight of the comparison group was 25.8 ( $\pm 0.49$ ) Kg and the mean difference between the two groups was 0.39 Kg. The mean (SD) height of the traditional game group was 125.5 ( $\pm 0.67$ ) centimeters (cm) and the mean height of the comparison group was 125.1 ( $\pm 0.62$ ) cm and the mean difference between the two groups was 0.41 cm.

Figure 1 illustrates the results testing effect of usual physical activities and traditional games on fundamental motor skills. Variance analyze of repeated measures indicated a significant difference in fundamental motor skills, effects of industrial program  $F(1,36) = 26.02$ ,  $P < 0.001$  and repeated measures  $F(2,36) = 96.15$ ,  $P < 0.001$ . The interaction between industrial program and repeated measures were significant [ $F(2,36) = 73.07$ ,  $P < 0.001$ ].



**Fig 1:** The effect of usual physical activities and traditional games on fundamental motor skills (3 times measurements)



**Fig 2:** The effect of usual physical activities and traditional games on locomotor skills (3 times measurements)

Results of LSD post hoc indicated that traditional games with mean difference 17.12 were more effective than daily activities group on gross motor skills ( $P < 0.001$ ).

Figure 2 illustrates testing effect of usual physical activities and traditional games on locomotor skills. Variance analyze of repeated measures indicated a significant difference in fundamental motor skills, effects of industrial program  $F(1,36)=11.14$ ,  $P < 0.002$  and repeated measures  $F(2,36)=173.37$ ,  $P < 0.001$ . The interaction between industrial program and repeated measures were significant [ $F(2,36)=50.05$ ,  $P < 0.001$ ].

Results of LSD post hoc to measure means of group indicated that traditional games with mean difference 2.23 were more effective than daily activities group on Locomotor skills ( $P < 0.001$ ).

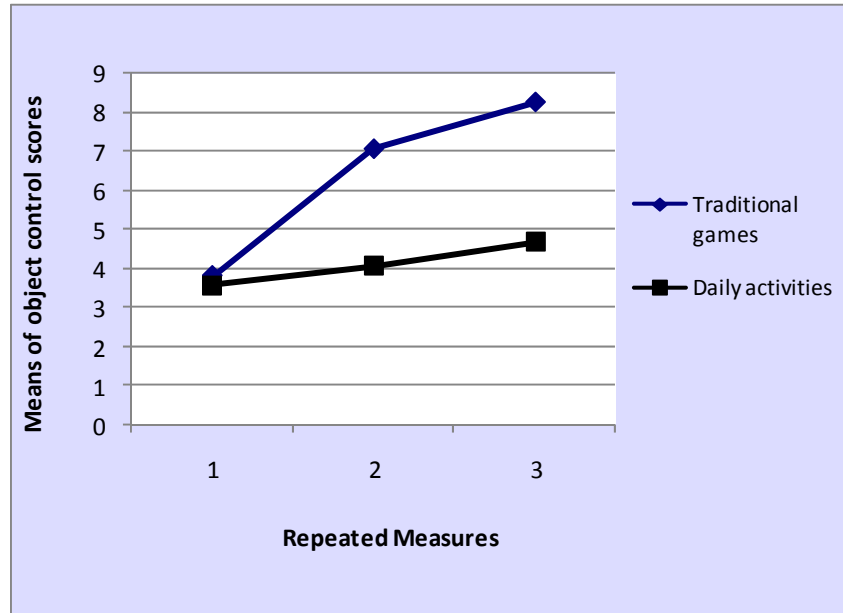
Figure 3 illustrates testing effect of usual physical activities and traditional games on object control skills. Variance Analyze of Repeated Measures indicated a significant difference in fundamental motor skills, effects of industrial program  $F(1,36)=10.92$ ,  $P < 0.002$  and repeated measures  $F(2,36)=303.716$ ,  $P < 0.001$ . The interaction between industrial program and repeated measures were significant [ $F(2,36)=75.16$ ,  $P < 0.001$ ].

Results of LSD post hoc to measure means of groups indicated that traditional games with mean difference 2.274 were more effective than daily activities group on object control skill ( $P < 0.001$ ).

## Discussion

The findings of this study demonstrate that traditional game program is more effective than daily activity in order to develop object control, locomotor and fundamental skills. This study found that gross motor skills can be influenced by an appropriate movement program.

The literature indicates that children develop fundamental motor skills through interaction with the environment. Theorists in the 1980s proposed that motor skills could be improved through practice, learning, and environmental interaction, which promote the integration of the identified sequential maturational stages of motor development [1, 4, 13]. The traditional game program components that may have



**Fig 3:** The effect of usual physical activities and traditional games on object control skills (3 times of measurements)

contributed to beneficial effects on manipulative and locomotor skills 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 environmental conditions are effective on motor skill development. Environmental conditions that include opportunities for practice, encouragement and instruction are crucial to the development of mature patterns of fundamental movement [1].

Children should have sufficient time to practice the fundamental skills. Practice opportunities 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, computer games, doing homework and going to school leaves no time

for physical activity. Sufficient equipments, facilities and time are critical for developing fundamental motor skills.

Parents and physical education teachers, who are not able to provide opportunities for fundamental motor skill improvement, often limit children's developmental potentials and in the end, children may fail in sports skills<sup>[1,4]</sup>.

For performing the traditional games many types of equipments 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 [1]. Quality program has special role in developing fundamental skills. Ashy, Lee, and Landin have suggested that practicing skills using correct technique is more important than the overall number of practice attempts [14]. 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. Traditional games are diverse and culturally important. Required skills of these games are well-matched with fundamental motor skills, locomotor, and object control skills. In traditional games as motor experiences, there are all kinds of locomotor skills (such as gallop, hop, slide, jump ...) and object control skills (catch, throw, kick, dribble ...). But in daily activities, children develop a few skills; they just perform games such as football, computer games and cycling. Thus, their skills do not have a little chance to develop. In this group, children often do computer games; these games make children to become immobile, and do not improve their movement skills.

Apache investigated effect of physical activity program on the motor development. Findings of research indicated that this program is even more effective than direct instruction program [5]. Goodway and Branta investigated effects of intervention program (12 weeks) on the fundamental motor skill development of children at risk of developmental delay [10]. They found that the intervention program group attained better results than comparison group in the object control and loco motor skills.

Miller investigated the facilitation of fundamental movement skill learning among children 3 to 5 years of age. She found that programs of instruction can increase fundamental movement pattern development beyond the level attained solely through maturation. She also found that an instructional program in skill development was more effective than a free-play program [1]. The similar findings has been reported in other studies [1,5,7-10]. A wide assortment of movement experiences provides children with a wealth of information on which to base their perceptions of themselves and the world about them [4].

A limitation to this study was solely participating of boys in this study, and this study did not survey effects of traditional game program on fundamental motor skills in girls.

## **Conclusion**

The findings of this study support the notion that fundamental motor skills are developed and learnt through practice and instruction. The children in the daily activity group made little improvement in their fundamental motor skills, they only improved some motor skills such as kick, run and throw, but they did not develop other skills such as dribbling, striking, underhand roll, hop and leap. These findings have applied implications in elementary school physical education programs.

## **Acknowledgment**

The authors gratefully acknowledge the financial support of this work from Sport Medicine Research Center of Tehran University of Medical Sciences (Grant No: 3966). They also wish to thank the teachers and children who helped us in this project.

## **References**

1. Gallahue DL, Donnelly FC. Movement Skill Acquisition. In: Developmental Physical Education for all Children. 4<sup>th</sup> ed. Champaign, IL: Human Kinetics. 2003; Pp: 257-75.
2. Payne, VG, Isaacs LD. Human Motor Development: A Life Span Approach. 5<sup>th</sup> ed. Mountain view, California: Mayfield. 2002; Pp:434-5.
3. Davis WE, Burton AW. Ecological task analysis: Translating movement behavior theory into practice. Adapted Physical Activity Quarterly. 1991;8(2):154-77.
4. Gallahue DL, Ozmon JC. Selected factor affecting motor development. In: Understanding Motor Development: Infants, Children, Adolescents, Adult with PowerWeb. 6<sup>th</sup> ed. New Yourk: Mac Graw Hill. 2006; Pp:48-74.

5. Apache RR. Activity-based intervention in motor skill development. *Percept Mot Skills*. 2005; 100(3 Pt 2): 1011-20.
6. Fisher A, Reilly JJ, Kelly LA, et al. Fundamental movement skills and habitual physical activity in young children. *J Med Sci Sports Exercise*. 2005; 37(4):684-8.
7. Wang JH. A study on gross motor skills of preschool children. *J Res Child Edu*. 2004; 19(1):32-43.
8. McKenzie TL, Alcaraz JE, Sallis JF, et al. Effects of a physical education program on children's manipulative skills. *J Teaching Phys Edu*. 1998;17(3):327-41.
9. Goodway JD, Crow H, Ward P. Effects of motor skill instruction on fundamental motor skill development. *Adapt Phys Activ Quart*. 2003;20(3):289-314.
10. Goodway JD, Branta CF. Influence of a motor skill intervention on fundamental motor skill development of disadvantaged preschool children. *Res Quart Exer Sport*. 2003;74(1):36-46.
11. Ulrich DA. Test of gross motor development. Austin, TX: Pro-ed. 2000.
12. Cooley D, Oakman R, McNaughton L, et al. Fundamental movement patterns in Tasmanian primary school children. *Percept Mot Skills*. 1997;84(1):307-16.
13. Okely AD, Booth MK, Patterson JW. Relationship of physical activity to fundamental movement skills among adolescents. *J Med Sci Sports Exer*. 2001; 33(11):1899-904.
14. Ashy MH, Lee AM, Landin DK. Relationship of practice using correct technique to achievement in motor skill. *J Teach Phys Edu*. 1988;7(2):115-20.