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EFFECTS OF SPEEDY AND DEMONSTRATION JUMPING-ROPE TRAINING ON GROSS MOTOR SKILLS

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ABSTRACT
The main purpose of this study was to examine the effects of speedy and demonstration jumping-rope training program on gross motor skills of fourth grade elementary boy students. Examining the running speed and agility, balance, strength and bilateral coordination sub-tests served as the other goals of this study. The research has been done in field-experimental method. The population includes all fourth grade elementary school boy students. 45 students selected randomly as sample of study and equally divided in two experimental (speedy and demonstration) and one control groups. The mean height and weight of subjects were 1.04 ± 0.06 meter and 37.75 ± 11.4 kg respectively. The results showed that there are significant differences in gross motor skills and sub-tests of balance, strength and bilateral coordination in speedy and demonstration. In other hand, based on the findings of this study both Jumping-rope training program had significant effects on gross motor skills of the subjects However, the results showed that no significant difference were reported in running speed and agility between three groups. Based on the results of this study, it is recommended that jumping-rope could be used as a suitable program for the development of gross motor skills of fourth grade elementary boy students.

KEY WORDS: balance, gross, jumping-rope, motor skills strength.

INTRODUCTION
Movement is a natural one and does have central role in children growth. This role is critical in different ground like recognition growth, affective growth and movement growth. Movement provides interaction to environment and responding to environment stimuli. Movement is the primary instrument in gathering information in children and helps them to be familiar with more complicated information (Gallahue and Ozmun, 2002). One of the most important objects of children growth study is to help trainers in communicating to children effectively (Parsa, 2006). In order to grow understanding-movement abilities in children, primary experience is very important. Although understanding-movement abilities does have different ratio related to environment and heredity, but one of important environmental factor in growth of these abilities is to how pass elementary years and sensitive years of children (Fallah, 1998). Game and physical activity does have sensitive and refining role in strengthening the level and understanding-movement growth in children. When child does activity or movement behavior, pleasure, freshness and game leads to repeating activity in movement and bodily activity (Gallahue and Ozmun, 2002).

Jumping-rope is a feasible and perfect activity in which does have positive effect on all bodily fitness and movement factors and is very cheap and in access of general in any place and now is an independent sport field, seeking and compounded of different skills as rhythmic and is along with acrobatic skills along music in which be executed by one, two and group in the two parts of speedy and demonstration. This sport field as sport activity, in scientific method and basic sport would be applied for increasing fitness level and general body fitness especially in low age in school sport and university (Tanavarz Project Method, 2011). Almost basic understanding-motor skills are of gross motor skill. Gross motor skills are those in which are using great muscle of body and includes skills for moving body in space (movement , maintaining balance against earth gravity force(stability movement)and giving force to objects and getting their forces (touch up movement) (Derashgi, 2007). The study results of Wilber (1966) and Roozen (2006) showed executing jump experiment by rope is a valuable activity in which leads to improvement in muscle strength, bodily resistance, heart health and blood vessels dependent to it, balance and bodily balance, agility and coordination among body muscles. Body good control are situation, balance and body's element symmetry and jumping to rope and bodily fitness are skills, innovation strength and creativity are the possible result of this activity (Wilber, 1966). Rapidity and speed of hands and feet are of the two sport characteristic influential on competitive superiority of all sports. Ropewalking is an experimental instrument without requirement of high time and different experimental meeting in a

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week increases rapidity and speed (Lee, 2010). Speedy experimental program strengthens upper part of body and lower part of body. In general, in a 4-weeks period after executing regular speedy experiment in athletes, corpus and forearm strengthen outstandingly. The ability of muscles behind feet shank and four heads of femur develop shoulder muscles and back and improve maintenance mode and balance of body (Lee, 2010). Student or athletes begins to game jugging by trainer order in 30 seconds. When rope has passed under right feet, counting would begin (Tanavarz Project Method, 2011).

There are so many skills in demonstration section as one, two persons or groups by short and tall rope and by two or more ropes (Roohi *et al*, 2010). Education program in national design of ropewalking has been approved and executed in country's schools in which include ten skills proposed and designed by rope walking association (Sadatrezaei, 2005). Of these skills, 6 skills includes: jumping twice and passing rope one time(stop on the feet)zigzag (jumping pair in any direction)pair back and forward, (open feet in each direction) feet scissor from forward, waist round is of gross skills. Ropewalking is improving coordination of nerves and muscles, improves motor rhythm, increases speed and reaction, and develops body capability (Roohi *et al*, 2010).
Jumping-rope experiments strengthen balance in athletes (Way, 2013). Youkslen (2008) study result showed bodily experiment influences on balance of 3-6years old children. Srhoj (2002), Shroj *et al* (2006), Gholami *et al* (2013), Aldmier *et al* (2013), believes there is positive relation among balance and agility and by improvement in one of them, the other will improve, too. Balance and agility grow by children interaction to environment and experiment through it. Balance and agility in game form is a pleasurable activity for children and involvement of non-game. In general, Jumping-rope strengthens body readiness- motor like coordination among nerve and muscle, agility, rhythm, transformation speed in a short term. (Hall *et al*, 1980; Perrot and Bertsch, 2007, Makiani, 2011).

Williams (1983) found balance progress from 3 to 18 years old by reviewing age and gender differences. Simons *et al* (1990) along with these result has found linear increases in stable balance of girls in 6 to 18 years old. Different studies result showed in general, women in childhood, in the two stable and seeking balances are better than men, but this superiority would vanish in youth (Gallahue and Ozmun, 2002). Williams and Hodes (2008) in a study on school boy and girls has concluded growth of basic skills is not influenced by contribution in sport activity and only grows based on age and boast. Emarati *et al* (2011) study result showed school selective games does have meaningful influence on speed, upper part coordination, upper part agility and understanding-motor grow in testier, but its influence are not meaningful in stable-seeking balance, bilateral coordination, strength, response speed, visual-motor control and social growth of testier.

A study has been done in general are influential on ropewalking and motor skills (Makiani, 2011; Chao and Shih, 2010; Nikleson, 2005; Ozer *et al*, 2011). But we compared speedy and demonstration experiment influence on gross skills in expert term, for the first time. As we mentioned above, and the result of studies requires examining the influence of Tanavarz National Project on gross motor skills of boy students in four grade? Does speedy Jumping-Rope education is influential on student gross motor skills in this age? Does demonstration Jumping-Rope education is influential on boy student gross motor skills?

MATERIALS AND METHODS

The method of research is field-experimental. Statistical population of research includes boy students in four grades in Babul city in the years of 2013-2014. They are educating in 117 schools. Among them, they have been selected randomly (cluster-stage) in the first stage 3 schools and in the next stage in any school, one class and in any class student, 15 students has been selected randomly in which divided in three equal groups of control (n=15), speedy group(n=15) and demonstration group (n=15). Therefore, research statistical society includes 45 students. Students executed Jumping-rope practice in the two groups of demonstration and speedy in 6 weeks and any two weeks by 40 minutes. In any session, at first about 10 minute has done general body warming including tension, movement, jumping fitted to student age. This group has done 10 minutes to class activity and 20 minutes to Jumping-rope program as the method of Tanavarz project (2011) and used of Bruininks-Oseretsky gross motor skills test including four subtests in the running speed and agility , balance, bilateral coordination and strength. Research hypothesis has been tested by the aidof inference statistic in variance one-way analysis and post-hoc Tukey test and used of $SPSS_{22}$ software in analyzing datum.

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The mean height and weight of subjects were 1.04 ± 0.06 meter and 37.75 ± 11.4 kg respectively.

Table 1: The result of Kruskal–Wallis test for the running speed and agility

variable	X^2	df	Sig.
Run speed and agility	5.92	2	0.052
balance	26.21	2	0.001

The result of Kruskal–Wallis test in table 1 shows that there is no significant differences among the mean of running speed and agility in the speedy, demonstration and control groups (p=0.052, x^2=5.92). Also, there is significant difference among the mean of students balance in speedy, demonstration and control jumping rope training groups (x^2=26.21, p=0.001). Therefore, we have used of pair comparison to equilibrium for determining the source of difference and test of sub-hypothesis.

Table 2: The results of pair comparing for balance test

Groups	Test statistic	Sig.	Adj.sig.
speedy-control	-14.76	0.001	0.006
demonstration -control	-24.23	0.001	0.001
speedy- demonstration	-9.46	0.047	0.142

The result of pair comparing in table 2 shows there is significant difference among the mean of balance growth in students in speedy Jumping-rope group (3.37) and control (0.06) (p=0.006). In other words, speedy jumping rope leads to significant improve in students balance. There is meaningful difference among the mean of students balance in demonstration Jumping-Rope group (6.000) and control (0.006) (p=0.001). In other words, demonstration Jumping-rope leads to meaningful improve in students balance growth. Also, there is no meaningful difference among the mean of balance growth in students in speedy and demonstration Jumping-rope group (p=0.142).

Table 3: The result of Kruskal–Wallis test for bilateral coordination growth

variable	X2	df	Sig.
bilateral coordination	28.46	2	0.001

The result of Kruskal–Wallis test in table 3 showed there is meaningful difference among the mean of bilateral coordination in speedy Jumping-rope group, demonstration and control groups (x^2=28.46, p=0.001). Therefore, we have used of pair comparison to equilibrium in determining difference source and testing sub-hypothesis.

Table4: The result of pair comparison for bilateral coordination growth test

Groups	Test statistic	Sig.	Adj.sig.
speedy-control	-17.57	0.001	0.001
demonstration -control	-23.60	0.001	0.001
speedy- demonstration	-5.82	0.213	0.639

The result of pair comparison in table 4 showed there is significance difference among bilateral coordination mean growth in speedy Jumping-rope group (4.21) and control (1.80). (p=0.001) in other words, speedy Jumping-rope leads to meaningful improve in students bilateral coordination. There is meaningful difference among the growth of bilateral coordination in demonstration Jumping-rope group (4.93) and control (1.80) (p=0.001). In other words, demonstration Jumping-rope leads to meaningful improve in students' bilateral coordination growth. Also, there is no meaningful difference among the mean of bilateral coordination in students in speedy Jumping-rope group and demonstration (p=0.639).

Table 5:The result of Kruskal–Wallis test for strength

variable	X2	df	Sig.
strength	23.51	2	0.001

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The result of Kruskal–Wallis test in table 5 showed there is meaningful difference among the mean of strength growth in speedy, demonstration and control demonstration Jumping-rope group (x2=23.51 p=0.001). Therefore, we have used of pair comparison in determining the resource of differences and testing sub-hypothesis.

Table 6: the result of pair comparison in strength growth subtest

Groups	Test statistic	Sig.	Adj, sig,
speedy-control	-4.16	0.352	1.000
demonstration -control	-20.53	0.001	0.001
speedy- demonstration	16.36	0.001	0.001

The result showed there is meaningful difference among the mean of students strength growth in speedy Jumping-rope group (2.33) (p=0.001). In other words, speedy Jumping-rope leads to meaningful improve in students' strength growth. There is no meaningful difference among children the mean strength growth in speedy Jumping-rope group (2.33) and demonstration (0.40) (p=0.001). Therefore, in other words, speedy Jumping-rope leads to meaningful improve in children strength growth than demonstration Jumping-rope.

Table 7: The result of one way variance analysis for gross motor skills

variable	Difference place	SS	df	MS	F	P
Gross motor skills	Among groups	844.99	2	422.4	31.44	0.001
	Inner groups	564.2	42	13.4		
	total	1409.2	42			

The result of one way variance analysis in table 7 showed there is meaningful difference among the mean growth of students gross motor skills in demonstration Jumping-rope group, speedy and control group.(p=0.001, f(2,42)=31.44). Therefore, we have used Tukey post-hoc test for determining difference source and sub hypothesis test.

Table8: The result of Tukey post-hoc test for gross motor skills growth

groups		sig
speedy Jumping-Rope	control	0.001
	demonstration Jumping-Rope	0.645
demonstration Jumping-Rope	control	0.001
	speedy Jumping-Rope	0.645

The result of Tukey post-hoc test in table 8 showed there is meaningful difference among students gross motor skill in speedy Jumping-rope group (10.93) and control (2.40) (p=0.003). In other words, speedy Jumping-rope leads to significant improve in student's gross motor skill. There is meaningful difference among students' gross motor skill in demonstration Jumping-rope group (12.13) and control (2.40) (p=0.001). In other words, demonstration Jumping-rope leads to meaningful improve in students' gross motor skill. Also, there is no meaningful difference among the mean growth of children gross motor skill in demonstration Jumping-rope group and speedy one (p=0.645).

DISCUSSION AND CONCLUSION

The result from examining one hypothesis based on difference among the mean running speed and agility in speedy, demonstration and control jumping rope groups does not have significant difference (p>0.05). The result showed Jumping-rope training has significant effect on the running speed and agility, but there is no meaningful difference among different groups. The result of this study is the concurrent with Akbari (2013), Emarati *et al* (2011), Makiani (2011), Heidari *et al* (2009), Rezvaniasl and Nourbakhsh (2007), Vertnaik *et al* (2006), Nikelson (2005), Vilson (2004). The cause of non-concurrent is that researchers do not divided subjects in the two demonstration-speedy and only evaluated the influence of Jumping-rope in the two groups. In recent study, students received about 6 weeks and any

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week about 2 sessions and about 40 minutes Jumping-rope training program. Because student contributing Jumping-rope program does have more progress in understanding-motor skills, we indicate this result are against boast theory in which indicates growth procedure would be controlled through internal factors (genetic) and no external (environmental and environmental factors) are influential on the amount of growth temporarily and at last heredity factors does control growth (Haywood, 1993). Jumping-rope program could be executed as an educational program in schools. One of the causes of none growing in students in understanding-motor skills is lacking feasible educational environment in this regard. The other one is using non-physical education teacher in sport hours. Also, lacking space and adequate facilities and the low amount of sport hours in schools in which these hours would be dedicated to other lessons. At last we compared the three groups of control, demonstration and speedy and showed there is no meaningful difference among these groups. But speedy ropewalking group does have more growth than control and demonstration in motor-recognizing skills in which approves the influence of ropewalking program on the growth of recognizing-motor skills in students.

The result of examining the two hypotheses showed there is meaningful difference among the mean balance growth in boy student in speedy, demonstration and control groups. ($p \leq 0.05$)the result of recent study is the same as researchers like Makiani (2011), Rezvaniasl and Nourbakhsh (2005), Sheikh *et al* (2003), Khalji and Emad (2004), Koan and Houng (2007), Rotinak *et al* (2006), Nikleson (2005), Wilson (2004), but is not the same as Emarati *et al* (2011) result. Findings difference is related to the influence of expert exercise on stable equilibrium and seeking contributor. Because ropewalking program does not require especial space and does have simple facilities, it requires providing facilities by authorities and student develop their understanding- motor abilities by contributing in these exercises. Also, the comparison among the three demonstration, speedy and control groups showed there is meaningful difference among demonstration - control group and is not the same for other groups (speedy, control, demonstration). In other words, demonstration Jumping-Rope group does more equilibrium than speedy and control Jumping-Rope groups.

The result of examining three hypothesis showed there is meaningful difference among bilateral coordination mean of boy students in speedy, demonstration and control of jumping rope groups ($p \leq 0.05$). Recent study result is the same as researchers like Makiani (2011), Rezvaniasl and Nourbakhsh (2005), Sheikh *et al* (2003), Khalji and Emad (2002), Ozer (2011), Koan and Hung (2007), Niklson (2005), Wilson (2004). Also we compared three controls, speedy, demonstration groups and result showed there is meaningful difference in comparing the two demonstration-controls, speedy-control groups and this difference is not the same as comparing speedy- demonstration group. In other words, demonstration Jumping-Rope and speedy groups do have more growth in coordination than control group. Study result is not the same as Emarati *et al* (2011), because strengthening this aspect of recognizing-motor growth requires expert exercise or long term exercise. Because Jumping-Rope program develops coordination in students, it is necessary to prepare facilities for students to develop their coordination by physical education experts.

The result of four hypothesis showed there is significant difference among the mean strength growth in boy students in speedy, demonstration and control groups of jumping- rope ($p<0.05$). Recent study result is the same as researchers like Khalaji *et al* (2002), Ozer (2011), Koan and Houng (2007), Wilson (2004). Also the comparison among three control, demonstration and speedy group showed there is meaningful difference among comparing demonstration-control and speedy- demonstration groups. This difference is not the same as demonstration-control group. In other words, speedy Jumping-rope group does have more strength growth than control and demonstration groups. The study research is not the same as Sheikh et al (2003), because any motor program does have different influence on un structure factors of recognizing-motor skills, also is not the same as Emarati *et al* (2011) result, strength increases is dependent to two factors of muscle measure and ability of central nerve system in general stimulating of muscles. Achieving these two factors require the principle of added loading during long term exercises.

The result of fifth hypothesis examination showed there is significance difference among gross motor skill in boy students in speedy, demonstration and control groups ($p \leq 0.05$). In other words, speedy and demonstration Jumping-rope leads to meaningful improve in gross motor skills in students. Recent study result is the same as researchers like Akbari (2013), Emarati *et al* (2011), Heidari *et al* (2009), Khalji *et al* (2002), Sheikh *et al* (2003), Ozer (2011), Koan and Houng (2007), Wrerotinak *et al* (2006), Miler (2006), Nikleson (2005), Wilson (2004) Ventesano and Kambas

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(2004). Also, there is no meaningful difference among speedy and demonstration Jumping-rope influence on gross motor skill growth in students.

Based on study result, we indicate jumping-rope program is influential on sub-structure factors of different dimensions of recognizing-motor skills especially gross motor skills. If it be practiced in correct method and in feasible amount, could have outstanding role in improving and developing balance, coordination and students strength.

REFERENCE

Akbari H. (2013). Comparing spark motor program to gymnastic educational program feasible to growth on the growth of basic skills in 6 to 8years old children. Motor Learning and Growth Seasonal. 13: 118-103.

Aldemir G.Y., Ramazanoğlu N., Çamlıgüney A.F. and Kaya F. (2013). The effects of dance education on motor performance of children. *African J. Music Education*. 1(2): 20-22.

Chao C. and Shih Y.L. (2010). The impact of rope jumping exercise on physical fitness of visually impaired students. Department of Physical Education, Asia University, 500, Lioufeng Road, Wufeng.

Derashgi P. (2007). Gross motor skills growth. *Physical Edu. Growth Magazine.* 22: 58-59.

Emarati F.S., Namazizade M., Mokhtari P. and Mohammadian F. (2011). Selective elementary school games on recognizing- motor growth and social growth of girl's in8-9 years old. *Res. Capability Sci.* 5(7): 661-673.

Fallah H.R. (1997). Examining preschool period influence on recognizing-motor skills of students in the first grade of Isfahan school. M.D thesis in physical education. Tarbiat Modarres University.

Gallahue D.L. and Ozmun L.C. (2002). Understanding motor development: infants, children adolescents, adults, 5th rd. Mc Grwa-Hill. New York, NY.

Ghasemi G.A., Salehi H. and Heidari L. (2012). The influence of rhythmic movement on recognizing-motor skills in low mental capable children. *Motor-Sport Growth and Learning Magazine.* 9: 75-92

Gholami F., Nourbakhsh P. and Sepasi H. (2013). Effect of selected exercises on dynamic skill promotion in fifth grade school girls. *European J. Experimental Biology*, 3(3): 507-511.

Hall J.T., Hall N. and Hall J. (1980). Physical education in elementary schools. Goodyear Publishing Company, 58.

Haywood K.M. (1993). Life span motor development. 2en. ed. University of Missouri: Human Kinetics Publishers.

Heidari L., Ghasemi G. and Salehi H. (2009). The influence of 8weeks program of selected rhythmic movement on recognizing-motor skills intelligence-quotient in low-mental ability children. Tehran, 7th international conference of physical education and sport science.

Khalji H. and Emad M. (2002). The influence of selected activity program on recognizing- motor performance of 4 to 6 years old children. *Sport Motor Sci. Magazine.* 1(1): 30-42.

Kwon M.S. and Hwang K.S. (2007). Effects of an exercise program on body composition, cardiopulmonary function, and physical fitness for obese children. Department of Nursing, Hallym University, Korea. kwon1314@hallym.ac.kr.

Lee B. (2010). Jump Rope Training, the complete system for fitness and performance. 2nd Edition (Paperback). Human Kinetics, 112-124.

Makiani M. (2011). The influence of Jumping-rope program on recognizing-motor skills in girls on third grade in elementary school. M.D thesis. Physical education and Sport Science College, Ahvaz shahid Chamran University.

Mellby R.E. (1936). Rope Jumping, *J. Health and Physical Education*, 7: 93-95.

Miller J. (2006). Primary school-aged children and fundamental motor skills – What is all fuss about? Referred Paper for publication and presentation at the Australian Association for Research in education (AARE), Adelaide, Retrieved from http://www.aare.edu.au/06pap/mil06230.pdf.

Nicklson M.S. (2005). Jumping through summer: Challenges of starting a jump rope program. *Florida Public Health Rev.* 2: 60-62.

Oksana M., Ahrabifard I. (2010). The effects of a 4-week after-school program on motor skills and fitness of kindergarten and first-grade students. *American J. Health Promotion*. 24(5): 299-303.

Ozer D., Duzgun I., Baltaci G., Karacan S. and Colakoglu F. (2011). The effects of rope or weighted rope jump training on strength, coordination and proprioception in adolescent female volleyball players. *J. Sports Medicine and Physical Fitness*, 51(2): 211-219.

Parsa M. (2006). Children and youth growth psychology. Tehran. Beesat publication.

Perrot A. and Bertsch J. (2007). Role of age in relation between two kinds of abilities and performance in acquisition of new motor skill. *Perceptual Motor Skill.* 104(1): 91-101.

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Rezvaniasl R. and Nourbakhsh P. (2005). The influence of 10 weeks school games on some recognizing-motor capabilities in girl student in third grade on Mahshahr city. MS thesis, Physical Education and Sport Science College. Ahvaz Shahid Chamran University.

Roohi M., Ghaffori A., Damroodi H. and Nasiridehbone M. (2010). Jumping-rope education, Tehran, Ahang Publication, 23-38.

Roozen M. (2006). A chart is presented that lists exercise instructions for jumping rope. *Men's Health.* 21(3): 70.

Sadatrezaei A. (2004). Jumping-Rope, Tehran, Education and training ministry publication office. p55-72

Sheikh M., Bagherzade F. and Yousefi S. (2003). School selected games influence on student motor growth in third grade in Tehran 5 district. *Olympic Magazine.* 11(1-2): 77-88.

Srhoj L., Katic R. and Kaliterna A. (2006). Motor abilities in dance structure performance in female students. Coll. Anthropology., 30(2): 335-341.

Srhoj LJ. (2002). Effect of motor abilities on performing the hear folk dance civilian in 11 year-old girls. *J. Coll Antroploe.* 26(2): 539-43.

Venetsanou F. and Kambas A. (2004). How Can a Traditional Greek Dances Program. Affect the motor proficiency of pre-school children? *Res. Dance Education*. 5(2): 127-138.

Way L. (2013). Jump fit: Jump rope for conditioning and fitness. www.jumprope.com.

Wilbur H. (1966). Plus values for rope Jumping. J. Health Physical Edu. Recreation. 37: 32-36.

Williams A.M. and Hodes NJ (2008). Practice, instruction and skill acquisition in soccer: Challenging tradition. *J. Sports Sci.*, 23(6): 637-650.

Wilson M. (2004). Promotion of jump rope in an elementary school. *Florida Public Health Rev.* 1: 59-62.

Wrotniak B.H. Epstein P.T., Dorn J.M., Jonesc K.E. and Kondilisc V.A. (2006). The Relationship between motor proficiency and physical activity in children. *Pediatrics.* 118(6): 1758-1765.

Youkslen A.D. (2008). Effect of exercise for fundamental movement skills in mentally retarded children. *Middle East J. Family Medicine*. 6(5): 249-252.

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