

Full Length Research Paper

The effects of dance education on motor performance of children

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This research has been aimed to demonstrate the effects of dance education on preadolescent children. A total of 114 students (56 of whom in dance group/58 in control group) at preadolescent (aged 11±.0 year) and adolescent (aged 14±.0 year) stages participated in the research. Prior to dance classes a variety of tests ranging from motor performance tests, flexibility (sit and reach), dynamic balance (anterior/posterior and medial/lateral), strength (vertical jump and long jump), acceleration (10 m), speed (30 m), coordination (hexagon test) and agility (changing the line test) were conducted. It has been clearly demonstrated that dance education plays an important role on motor development of preadolescent and adolescent children, and comparisons between groups have indicated that children receiving dance education elicit a better line of development.

Key words: Dance, motor education, performance, education, salsa.

INTRODUCTION

Development of children consists of a variety of layers for example physical, mental, emotional, social each of which is a part of a whole. Motor development develops in parallel with mental and emotional development patterns. The acquisition of coordinative skills, however, is a result of the learning process (Muratli, 1997). The first and basic movements of child development cover the early childhood-adolescent stages. Basic skills are acquired at this period (Bekman, 2000).

Nowadays trainers state that motor education lessons must include theater, game, dance and art activities, and that especially rhythm and dance education to be applied during Physical Education (P.E.) classes plays a crucial role in development of motor skills of children (Oktay, 2000). Although the positive contribution of sportive activities is discovered through researches, the effects of dance on physical conformity are not known well enough. Dance trainers are quite conscious about the use of dance but most of their knowledge is far from being scientific.

In recent years, there has been an increase in the

number of researches conducted regarding the potential physiological and psychological benefits (Quin et al., 2007) The aim of this study is to put forth the positive effects of dance education on motor development, which is planned as a part of Physical Education classes for preadolescent and adolescent children and to develop a training program to be applied during Physical Education classes.

MATERIALS AND METHODS

Participants

A total of 114 preadolescent (aged 11±.0 year, dance group: 15 males, 15 females / control group: 17 males, 13 females) and adolescent (aged 14±.0 year, dance group: 13 males, 13 females / control group: 16 males, 12 females) students at 5th and 7th grade took part in the research. The physical traits of control and experiment group members have been demonstrated in Table 2. They gave their informed consent to the experiment procedure as required by the Helsinki Declaration (1964) and Istanbul University Medical Faculty Ethics Committee.

Procedures

The members of the dance group participated in the theater, dance and Physical Education classes for 20 weeks (2 days a week, 2 classes a day: 45 min + 45 min = 90 min). Students in the control

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Table 1. Dance training program.

1- 2 weeks	Basic rhythm training exercises
3- 4 weeks	Basic rhythm and dance training exercise
5-6 weeks	Basic stance, balance, rotation and body line work
7-8 weeks	Knowledge of music in Salsa basic step and hand to hand
9-10 weeks	Salsa; mambo, rumba, spot turn, cross body, basic figures types
11-12 weeks	Salsa ,basic figures types, spins and hand to hand.
13-14 weeks	Salsa intermediate figures; double cross body, double or tripple turns, lifts, drops.
15-16 weeks	Salsa intermediate, double cross body, double or tripple turns, lifts
17-18 weeks	Salsa advanced combination, double cross body, double or tripple turns, lifts, choreography and studies on the show.
19-20 weeks	Salsa advanced combination, choreography and studies on the show.

Table 2. Data regarding the physical development of preadolescent and adolescent children.

Groups	Age	n	Height (cm)		p	Weight (kg)		p	
			Pre-test	Post-test		Pre-test	Post-test		
Adolescent	Dance	14	26	153.27±7.52	156.81±8.16	p>0.05	51.08±14.77	53.46±12.31	0.044
	Control	14	28	151.39±6.66	155.75±6.28		50.07±12.66	55.04±12.37	
Pre- adolescent	Dance	11	30	145.77±8.16	149.20±8.06	p>0.05	39.93±9.04	44.13±9.81	0.001
	Control	11	30	142.27±6.63	147.93±5.77		41.03±9.42	43.50±9.75	

group followed the Physical Education curriculum in the same process. It was established that students in both groups do not participate in extra-curricular activities.

Prior to and following dance classes a variety of tests ranging from motor performance tests, flexibility (sit and reach), dynamic balance (anterior/posterior and medial/lateral) (sport expert MED-SP300 balance platform, Tumer Eng. Ankara, Turkey), strength (vertical jump and long jump), acceleration (10 m), speed (30 m) (new test 2000 ,Star Trac-Unisen Inc., U.K.), coordination (hexagon test) and agility (changing the line test) were conducted during the same hours of the day from 10:00 to 14:00.

The drama and dance program, which is shown in Table 1, lasted for 20 weeks (2 days a week, 2 classes a day: 45 min + 45 min = 90 min) and made up of salsa dance practices which is regarded as the embodiment of all ballroom dances. Tables 3 and 4

During the research a number of different test techniques were applied for example descriptive statistics for data analysis; paired t test for evaluating the difference between first test and last test values of groups; independent t test to compare groups; univariate analysis of variance to evaluate the joint effect of independent multi variables. For the total set of analyses SPSS 14.0 program were applied.

RESULTS

There has been no statistical difference between ante- and post-test measurements obtained at anterior/posterior and medial/lateral balance of the children at preadolescent stage; and the values obtained at acceleration (10 m) and speed (30 m) tests ($p>0.05$). Statistically speaking, the difference is quite meaningful

as to ante-test and post-test values obtained at flexibility (sit and reach), coordination (hexagon test), acceleration (10 m), speed (30 m), vertical jump, long jump and agility (changing the line test) tests for preadolescent children than those obtained at flexibility (sit and reach), coordination (hexagon test), vertical jump, long jump and agility (changing the line test), dynamic balance (anterior/posterior and medial/lateral) tests for preadolescent children ($p<0.01$).

DISCUSSION

The preadolescent and adolescent stages are quite important in order for children to develop motor skills thanks to controlled environments (Miller, 2006). Therefore, the curriculum shaping the first (7 to 12 years) and second (12 to 15 years) periods play an important role. Dance unites the body and spirit (Ho, 2005), bringing about permanent changes in psychological development of the child (Droege, 2008). It is the poetic expression of physical movement with the help of musical rhythm. Dance is a perfect way of developing aesthetic taste and the feeling of beauty thanks to the rhythm of its figures (Schmit et al., 2005).

As it is the case with our study, it was stated that the increase in body weight and body height maintains a continuous pattern for children between the ages of 10

Table 3. Results of pre and post tests for motor performans of pre-adolescent period-children.

Parameter	Dance group		Control group		p
	Pre-test score	Post-test score	Pre-test score	Post-test score	
	M±SD	M±SD	M±SD	M±SD	
Flexibility (Sit and reach)(cm)	23.93±4.03	30.37±3.41	21.40±4.47	24.01±4.33	0.000
Coordination (Hegzagon test) (sn)	18.71±3.93	14.39±2.31	18.43±3.03	16.95±3.98	0.000
Acceleration 10 m(sn)	2.43±.21	1.87±.11	2.28±.21	2.18±.20	0.000
Speed 30 m (sn)	6.60±.65	5.37±.40	6.17±.51	5.78±.49	0.000
Vertical Jump (cm)	21.47±3.66	28.73±2.70	21.37±3.29	22.43±3.34	0.000
Agility (Changing the line test) (sn)	7.13±.54	4.78±.43	7.22±.53	6.78±.61	0.000
Standing long jump (cm)	133.50±17.89	147.97±18.81	124.60±14.84	131.40±15.54	0.003
Dynamic balance (M/L) (degree)	8.82±2.10	6.43±2.16	9.87±1.86	5.85±3.26	p>0.05
Dynamic balance (A/P) (degree)	9.04±2.42	5.19±1.66	9.15±1.66	5.65±3.46	p>0.05

M: mean; S.D. : standard deviation.

Table 4. Results of pre and post tests for motor performans of adolescent period-children.

Parameter	Dance group		Control group		p
	Pre-test score	Post-test score	Pre-test score	Post-test score	
	M±SD	M±SD	M±SD	M±SD	
Flexibility (Sit and reach)(cm)	22.58±6.12	29.00±5.30	18.75±6.11	23.68±4.48	0.024
Coordination (Hegzagon test) (sn)	16.35±2.03	13.01±1.97	17.67±3.09	15.98±3.39	0.000
Acceleration 10 m (sn)	2.34±.21	2.00±.14	2.45±.26	2.20±.20	p>0.05
Speed 30 m (sn)	6.18±.77	5.30±.44	6.54±.62	5.78±.74	p>0.05
Vertical Jump (cm)	20.96±4.40	25.77±4.72	19.84±3.62	22.89±3.30	0.011
Agility (Changing the line test) (sn)	6.44±.49	4.71±.46	6.62±.56	5.51±.53	0.000
Standing long jump (cm)	129.92±21.52	150.50±20.94	124.60±14.84	131.40±15.54	0.012
Dynamic balance (M/L) (degree)	7.46±2.30	5.19±2.42	9.29±1.43	9.28±2.54	0.006
Dynamic balance (A/P) (degree)	8.22±2.24	3.92±1.38	9.15±1.66	5.65±3.46	0.000

M: mean; S.D. : standard deviation.

and 14 (Arıcı, 2006). Moreover, according to Cosan (2005), the body height and weight values of children at both age groups were in line with body height and weight standards determined for Turkish children.

In a research conducted on 5th grade female children, it is demonstrated that folk dances have a large impact on the development of coordination, balance, agility and power parameters (Srhoj, 2002). In another research by Srhoj et al. (2006), it is clearly put forth that dance is quite a useful tool to maintain basic motor skills in addition to being a unique way of education to develop kinesiology of female children. The same research also demonstrated that motor skills play an important role on performance at folk dances and the dance performance is in closely related respectively with coordination, explosive power, and speed (movement frequency). In Ross and Butterfield's (1989) studies, it is underlined that dance/movement training program effects dearly the development of rough motor skills for example climbing

stairs, running, jumping, hopping etc. as well as development of physical compatibility.

In our research, at the end of a 20-week dance training period (2 days a week, 2 h a day, 45 min + 45 min = 90 min), a noteworthy difference were detected between the dance group and control group of preadolescent children at values of flexibility, coordination, dynamic balance (M/L and A/P), vertical jump, agility and long jump. However, there was no meaningful difference between dynamic balance (M/L and A/P) values. There were noteworthy differences between the dance group and control group of adolescent children at flexibility, coordination, acceleration (10 m), speed (30 m), vertical jump, agility and long jump values. However, there was no meaningful difference between acceleration (10 m) and speed (30 m) values. In line with the research we conducted, quite many researchers also indicated that rhythmic skill and physical activity training programs help adolescent and preadolescent children to feature better physical performance

(Venetsanou and Kambas, 2004), (Strong et al., 2005), (Twisk et al., 1998), (Quin et al., 2007), (Holmen et al., 2002), (Baquet et al., 2001), (Blair et al., 2001).

The dance training that students received throughout the year was successfully staged in the presence of teachers, students and parents during year-end ceremonies. It is widely known that such ceremonies help students to build a better level of self-esteem and self-respect (Daley and Buchanan, 1999).

Conclusion

It is concluded that dance training classes as a part of the Physical Education classes were maintained over a 20-week period to measure flexibility, coordination, dynamic balance (M/L and A/P), vertical jump, agility, acceleration (10 m), speed (30 m) and long jump values of preadolescent and adolescent children and these dance classes in question have quite a positive effect on children.

REFERENCES

- Arıcı H (2006). Okullarda Beden Eğitimi, Öğretmenler ve Öğrenciler İçin. [Training for students and trainer in school]. Bagirgan Publ., Ankara, Turkey, pp. 35-36.
- Baquet G, Berthoin S, Gerbeaux M, Van Praagh E (2001). High-intensity aerobic training during a 10 week one hour physical education cycle. Effects on physical fitness on adolescents aged 11 to 16. *Int. J. Sports Med.*, 22(4): 295-300.
- Bekman S, Hohhman M, Weikart D (2000). Küçük çocukların eğitimi [Educating Young Children]. Translated into Turkish by Saltiel, S and Ögüt Ü, Hisar Eğitim Vakfı Publ. Istanbul, Turkey.
- Blair S, Cheng Y, Holder S (2001). Is physical activity or physical fitness more important in defining health related benefits. *Med. Sci. Sport Exerc.*, 33(6): 379-398.
- Coşan F (2005). Olimpiyatlar İçin Sporcu Kaynağı Projesi: Türkiye'de Çocukların Spora Yönlendirilmesinde Uygulama Modeli, Atletizm Altyapı Çalışmalarının Bilimsel Temelleri. [Project of athletes' for Olympic source: Model of children integrate to sport, Scientific source of athletics integrate substructure training]. 1. Baskı [1.Edition], Uğur publ., Istanbul, Turkey.
- Daley AJ, Buchanan J (1999). Aerobic dance and physical self-perceptions in female adolescents: Some implications for physical education. *Res. Quart. Exerc. Sport*, 70(2): 196-200.
- Droege TC (2008). Collaboration of expressive therapies with children diagnosed with Acute Lymphoblastic Leukemia. PhD dissertation, The Faculty of The Chicago School of Professional, Chicago, USA.
- Ho RTH (2005). Effects of dance movement therapy on Chinese cancer patients: A pilot study in Hong Kong. *Arts Psychother.*, 32(5): 337-345.
- Holmen TL, Barrett-Connor E, Clausen J, Holmen J, Bjermer L (2002). Physical exercise, sports, and lung function in smoking versus non-smoking adolescents. *Eur. Respir. J.*, 19: 8-15.
- Miller J (2006). Primary School-Aged Children and Fundamental Motor Skills –What is All The Fuss About? Adelaide: Australian Association for Research in Education (AARE).
- Muratlı S (1997). Antrenman bilim ışığı altında çocuk ve spor. [Children and sports in training science] Kültür Matbaası, Bagirgan Publ., Ankara, Turkey.
- Oktay A (2000). Yaşamın sihirli yılları okul öncesi dönem. [Life magic years in pre-school]. Epilasyon Publ., Istanbul, Turkey.
- Quin E, Redding E, Quedsted E, Weller P (2007). The effects of an eight-week creative dance program on the physiological and psychological status of 11-14 year old adolescents: an experimental study. *J. Dance Med. Sci.*, 11(1): 77-82.
- Ross A, Butterfield SA (1989). The effects of a dance movement education curriculum on selected psychomotor skills of children in grades K-8. *Res. Rural Educ.*, 6(1): 51-56.
- Schmit, JM, Regis DI, Riley MA (2005). Dynamic patterns of postural sway in ballet dancers and track athletes. *Exp. Brain Res.*, 163(3): 370-378.
- Srroj L (2002). Effect of motor abilities on performing the hvar folk dance cecilion in 11-year-old girls. *Coll. Antropol.*, 26(2): 539-543.
- Srroj L, Katic R, Kaliterna A (2006). Motor abilities in dance structure performance in female students. *Coll. Antropol.*, 30(2): 335-341.
- Strong WB, Malina RM, Blimke CJR (2005). Daniels SR. and et. Al. Evidence based physical activity for school-age youth. *J. Pediatr.*, 146(6): 732-737.
- Twisk JWR, Staal BJ, Brinkman MN, Kemper HCG (1998). Tracking of lung function parameters and the longitudinal relationship with lifestyle. *Euro. Respir. J.*, 12: 627-634.
- Venetsanou F, Kambas A (2004). How can a traditional greek dances programme affect the motor proficiency of pre-school children? *Res. Dance Educ.*, 5(2): 127-138.