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EFFECT OF MULTI-COMPONENT KINETIC EDUCATION ON STATIC BALANCE ABILITY OF SCHOOLCHILDREN

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Abstract

Balance ability is an important motor ability function of children and needs monitoring from the developing ages to make children grow into expert adults. Hence, scientific grooming of children in the balance ability needs special mention. Sixty male children in the age group of ten to thirteen were divided randomly into two groups, one as multi component kinetic education group and another as control group. Multi component kinetic training was given to the group for three months. Stork stand test scores were taken as static balance ability scores of the children. Baseline, post test and adjusted post test means of the balance scores were tested with the ANCOVA and found that the multi component kinetic education program improved the static balance ability of the multi component group significantly. Hence, it was concluded that the multi component kinetic education program with components of muscle strength, muscular endurance and orientation could bring significant positive improvements in the static balance ability of the children.

Key Words: *Multi component kinetic training and Static balance.*

INTRODUCTION

The balancing of rotating bodies is important to avoid vibration. In heavy industrial machines such as gas turbines and electric generators, vibration can cause catastrophic failure, as well as noise and discomfort. In the case of a narrow wheel, balancing simply involves moving the centre of gravity to the centre of rotation. For a system to be in complete balance both force and couple polygons should be closed.

Static Balance

Static balance occurs when the centre of gravity of an object is on the axis of rotation.[1] The object can therefore remain stationary, with the axis horizontal, without the application of any braking force. It has no tendency to rotate due to the force of gravity.

Dynamic Balance

Dynamic Balance is the ability to maintain your equilibrium while moving through space. With good dynamic balance you can climb a ladder, walk on the beach or go up and down stairs.

- **Your central nervous system** (brain and spinal cord). Diseases, tumors and even fatty deposits in the brain can lead to balance problems.
- **Your muscles**. Loss of muscle mass and strength can cause your reaction times to be delayed increasing your risk of falls.
- **Your flexibility**. Tight muscles, joints and ligaments can lead to balance problems.

- **Your body awareness**. We have small nerve endings in our muscles, joints and skin that tell us where we are in space. Inactivity, poor posture and even stress can cause these to malfunction leading to decreased balance.
- **Your vestibular system**. Located in your inner ear, this system sends messages to your brain about your head position allowing your body to react accordingly. So problems with your vestibular system can throw you off balance.
- **Your vision**. Cataracts, glaucoma, macular degeneration can all have a negative effect on your balance.
- **Arthritis** in your neck, causing changes in posture. Blood vessels leading to your brain may be compressed when you shoulder check while driving or look up to get something out of a cupboard. This can cause dizziness or fainting.
- **Hardening of the arteries** (atherosclerosis) can decrease blood flow to the brain also creating dizziness or fainting.
- **Loss of hearing** caused by degeneration of the nerves leading to your ears may affect your ability to balance.

Balance ability is one of the important motor ability functions of individuals. Balance ability increases with the age and there may be difference in the balance ability of males and females as the balance ability depend on the factors like muscle tonus, sense of kinesthesia and other sensory inputs (2). Balance ability of an individual protects from the fall accidents and also to perform better in motor functions and to excel in certain kinds of games and sport situations. Proprioception ability which includes orientation and balance abilities together make children more agile towards motor functions of day to day activities as well sports activities (3). Strengthening of the vestibular functions and muscular tonus could lead to the better balance ability of the children. The sense of proprioception which includes some areas of orientation and balance ability needs to be matured during the developing ages and well before thirteen to fourteen years of age of children. It may be possible to develop balance ability of individuals through the development of muscle tonus and preparedness of muscle (7, 8). Hence, special training is essential to develop the function of balance of the children through verifiable means so that children grow into adults with better motor abilities to make better individuals and better sports persons (1). Hence the present study examined the effect of multi component kinetic education on the balance ability of male school children of 10 to 13 years.

METHODOLOGY

Selection of Subjects

A total of sixty male school children in the age group of ten to thirteen, who volunteered for the study with written consent of the parents, participated in the study. The sixty children who were taken were randomly assigned to two groups and one group acted as Multi component group and another acted as control group. The study was done in karur region. Multi component group was given multi component kinetic education program for three months. Each session lasted for about one hour and four such sessions were there for a week.

The parents of the children were also invited to witness the kinetic education

program of their children to avoid further complications. The multi component kinetic education program consisted of tumblings, body resistance exercise programs and few exercises resembling balance exercises. All precautions were taken to meet the ethical standards of the study of children. Stork static balance test score was measured to understand the balance ability of the children of the study (4). Best of the three trials of the test was taken as balance score. Baseline and post test static balance ability scores were measured and ANCOVA was used to know the effectiveness of the multi component kinetic education program on the static balance ability of the children. The level of significance used for the study was 0.05.

RESULTS

Analysis of Covariance as depicted in table I shows that the Multi component kinetic education program of three months brought significant improvements in the static balance ability of the Multi component kinetic education group when compared to the control group since the obtained
F value ie 62.03is much higher when compared to the critical F value ie 3.96. Since the obtained.

Table- I
Analysis of Covariance for Stork static balance ability

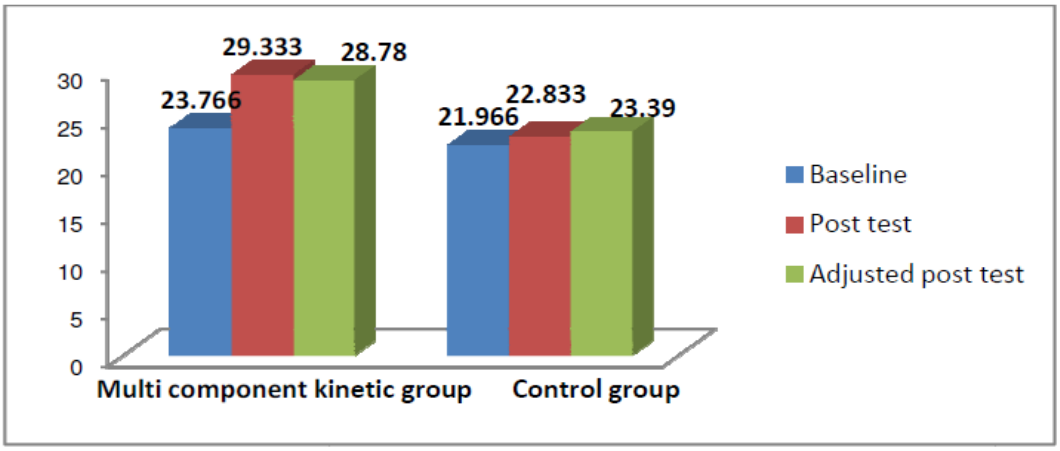
Source	SS	df	MS	F/Cr.F	P
Adjusted means	424.79	1	424.79	62.03/3.96	<.0001
Adjusted error	390.37	57	6.85		
Adjusted total	815.17	58			

Table- II
Test for Homogeneity of regression for post test values and covariate

Source	SS	df	MS	F/Cr.F	P
Between regressions	0.79	1	0.79	0.11/3.96	.7413
Remainder	389.58	56	6.96		
Adjusted error	390.37	57			

F ie 0.11 (table- II) for the test of homogeneity of regression for post test values and covariate is less than the critical F ie 3.96, the post test static balance values and covariate are in linear regression and hence the Analysis of covariance is acceptable and dependable. The difference

Fig- 1 Baseline, Post test and adjusted pos test means of static balance.



Between the adjusted post test static balance score (28.78) and baseline static balance score (23.76) of the Multi component kinetic education group (5.02) may be quite significant. Hence, the improvement of 5.02 in the static balance ability of the Multi significant improvement through the effect of the multi component kinetic education to the children of the study.

DISCUSSION ON FINDINGS

Improvement in the proprioception ability through stabilization and maturity of proprioceptors could lead to the improved orientation and balance ability among individuals and especially among children of developing age. Along with this, the improvement in muscular tonus through better muscular strength and muscle endurance could lead to the improvements in the balance ability (5) of the children. Hence, the multi component kinetic education program (6) with encompassing components of balance, strength and general endurance could have lead to the significant improvements in the static balance ability of the children of the study. The multi component kinetic education program might have caused to improve in the children the significant levels of muscle strength, muscle endurance and orientation ability and hence the consequent improvement in the balance ability.

CONCLUSION

The multi component kinetic education program, with components of muscle strength, muscular endurance and proprioception ability brings significant improvements in the static balance ability of the children.

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