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A Longitudinal Study on Balance Among 10 Years Boys and Girls

KEYWORDS: Static Balance, 10 and 11 yrs school going girls and boys

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ABSTRACT *Balance is an importance factor is our daily life. It is a biological system that enables us to know where bodies are in the movement and maintain a desire position. Static Balance is the ability to maintain total body equilibrium whiles the body in a static position. For that the purpose of the study was to observe the changes of static balance with the increase of age from 10 years to 12 years boys and girls. Sixty (60) school going boys and Sixty (60) school going girls 10 and 11 yrs of age were selected randomly as subjects for the present study. All the subjects were selected from kalyani Sub-Division school of West Bengal. To conduct the present study age, Height and Weight of the subjects were collected as personal data and Static Balance as criterion measure. Static Balance was measured Stork Stand Test in seconds. Five trails were taken of the particular test every after six month. The Mean difference in Balance for 10 years girls and boys was compare and analyzed through statistical procedure by using t-ratio. The result of the present study was showed that the Girls had performed Balance Significantly and they had proved in trail after trail.*

Introduction

Balance is a biological system that enables us to know where bodies are in the movement and maintain a desired position. Normal Balance depends on information from the inner ear, other senses and muscular movements in biomechanics. Balance is an ability to maintain the maximum centre of gravity of the body within the base of support with normal posture sway. Balance is the result of a number of body systems working together – specially in order to achieve the eyes, ears and the body's sense where it is in space needs to be intact. The balance system works with visual and skeletal system to maintain orientation. Our sense of balance is specially regulated by a complex interaction between the following parts of the nervous system.

- The inner ears monitors and direction of the motion, such as turning or forward or backward, side by side and upward down motion.
- The eyes observe where the body is in space.
- Muscles and joint sensory receptor report what part of the body is moving.
- The central nervous system possesses all the bits of information from the mention systems to make some coordinated sense out of it all.

Balance is an important factor in our daily life. Balance is of primary importance for activities like dance, which is considered as the highest form of movement. For all persons' Balance makes movement graceful. Balance depends on a huge number of factors. They can be categorized into different groups. Mechanical factors, psychological factors, physiological factors etc. Balance depends on three sets of sensors in the body. There are sensors in the muscles and joints of the foot and leg that send message to the brain when the muscles are stretched by learning in any direction. The eyes act as sensors telling the brain where the body is with respect to objects in space. Finally, the vestibular-apparatus a set of fluid filled sacs locked in the brain about where the head is, how fast it is moving, and it helps to keep the eyes on target and body parts correctly aligned. Balance is one of the physical fitness components. According to modern approach it has been included as a coordinative component of fitness. This indicates that Balance helps an individual to use conditional component namely speed, strength and endurance more effectively.

The body is a amazing machine but it needs many elements to keep running at its best. The sense of Balance usually deteriorates in posses of aging of a person. However it can be improved considerably with the help of special training. Balance is a multidimensional subdomain.

Base (1939) worked extensively with Balance. Balance can be classified as either static or dynamic. Static Balance is the ability to maintain total body equilibrium while standing Balance is one spot whereas dynamic Balance involves the ability to maintain equilibrium while moving one spot to another. The type static Balance can be influenced by the instruction of balancing track as well as whether the Balance is performed with eyes opened or closed. Dynamic Balance can be divided into simple or complex task based on the plans of the Balance involved.

It is a ball and a socket stabilomter is used complex Balance is required more than one plane.

Kinesthetic perception is the ability to perceive the body's position in space (1968). Although tests of it are the best objectives of the sub-domains of human performance. It is well accepted as an area of that must be considered. It is most difficult to measure in term of reliability and validity.

Perhaps the most important issue is to keep in mind when you are testing in human sub-domains is the specificity of task. The specificity relates directly to the reliability and validity of particular measurement. Remember, a test is reliable and valid only under particular circumstances. e.g. for a given gender, age, or test environment and is not generally reliable or valid, Balance and Kinesthetic perception are quite different from each other. However, perception is an important contributor to Balance. Balance is involved to some degree with all motor performance and some performance depends on heavily upon Balance. Among them are certain gymnastic events such as Balance beam, floor exercise, diving and some forms of dancing also required unusual amount of Balance. Stability is one of the special

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importance in all body contact sports. Such as wrestling, football, rugby, soccer etc. Balance in certain position is strongly depends on strength because the supporting muscles must be able to hold weight and body parts firmly in position. Therefore in some cases Balance will improve a limited amount as a result of increased strength. The best way, a person can improve through extensive practice of balancing in the particular position. In Balance, as in many other aspect of performance, correct practice makes perfect.

In addition to agility, reaction, co-ordination and strength, Kinesthetic perception contribute to Balance. Balance is the ability to remain in equilibrium. When the body is in equilibrium, an even adjustment exists among all opposing forces and the body remains balanced. Balance tests are static or dynamic. Static test measure ability to remain in Balance in a stationary position while dynamic tests measure ability to remain Balance in a dynamic or moving position.

SELECTION OF SUBJECTS:

Sixty school going boys and sixty school going girls 10 and 11 Yrs of age were selected randomly as subjects for the present study. All the subjects were selected from Kalyani Sub- Division school of West Bengal. To conduct the present study age, Height and Weight of the subjects were collected as personal data and Static Balance as criterion measure.

SELECTION OF BALANCE TEST:

To measure the Static Balance of the subjects, the researcher had considered Stork Stand Test as criteria because the Stork Stand Test was easy to administer for both boys and girls and the test was also appropriate for the particular age group of the subjects. The other tests which were available for measuring Static Balance were slightly difficult to administer on this particular age group

Procedure :

The subjects were asked to stand on their toes on a wooden piece on the dominating foot and also asked to place the other foot on the inside of the supporting knee keeping their hands on their waist of the subjects. On the signal (going signal) he or she raised the heel from the standing stance and maintained the Balance as long as possible without moving the ball of the foot from the initial stance keeping the correct body position. Three trials were given to the subjects.

Scoring:

The longest time in second of the subject within the three trials of the Balance test was considered as the score of the particular test. After the data standard statistical Procedure had been adopted for result & discussion.

The mean differences in Balance for 10 Yrs girls between Trial-1 vs Trial-2, Trial-1 vs Trial-3,Traial-1 vs Trial-4 and Trial-1 vs Trial-5 were 0.16, 3.56, 5.76 and 9.60 respectively. Comparing with critical value it was found there were no significant difference in balance between Trial-1 and Trail-2 and Trial-1 and Trial-3 but significant difference found between Trial-1 and Trial-4 and Trial-1 and Trial-5. So in the second year the balance of the 10 yrs girls' student were improved.

The mean difference between Trial-2 vs Trial-3 was 3.40 which was not significant but the mean difference in balance for 10 Yrs girls between Trial-5 were 5.60 and 9.44 respectively.

Where both the difference was significant. The mean differences between Trial-3 vs Trial-4 was found 2.20 which was not significant but the difference between Trial -3 vs Trial-5 was found 6.04 which was significant. The mean difference in balance for 10 Yrs girls between Trial-4 vs Trial-5 was found 3.84 which was not significant. It was concluded that balance had improved significantly after 1 Year from the gap. On the basis of result and discussion the following conclusions were drawn:-

The Static balance for 10 Yrs boys were not improved in 1st year, but in the second year the balance had improved but in a significant manner.

The static Balance for 10 Yrs girls were improved from 3rd Trial to 5th Trial significantly i.e. after one year.

Balance for 10 Years Boys :

The mean, SD & F value of Balance of 10 years boys group for five trials were presented in Table No. 1

Table No. 1

Represents mean, SD and F values of Balance (min.) of 10 years boys in five trials

10 years Boys						
	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	F Value
Mean	29.56	28.5	34.26	30.60	36.03	1.94 NS
SD	14.30	11.82	10.90	13.85	11.91	

Level of significance of F-value at 0.05 level = 2.60

The mean value of balance of five Trials i.e. Trial-1, Trial-2, Trial-3, Trial-4 and Trial-5 were 29.56, 28.5, 34.26, 30.60 and 36.03 respectively and the SD values of five trials were 14.30, 11.82, 10.90, 13.85 and 11.91 respectively. Comparing the mean & SD values in five trials there were some differences among the values were observed. To observe the significant difference, the 'F' value was calculated and found to be 1.94 which was not significant though some mean value differences were observed.

The mean and SD of the five trials in Balance for 10 years boys were also presented in Fig. 1.

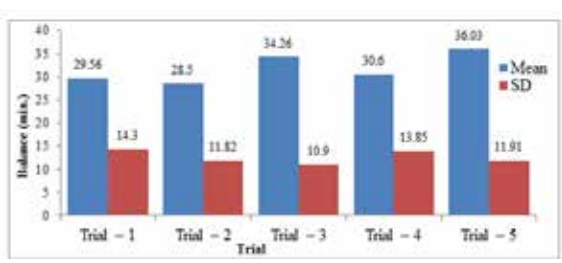

Fig. 1 : Showing Mean and SD of Balance of 10 years boys in five trials

Balance for 10 Years Girls :

The mean, SD and F value of Balance of 10 years girls group for five trials were presented in Table No. 2.

Table No. 2

Represents mean, SD and F values of Balance (min.) of 10 years girls of five trials

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10 years Girls						
	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	F Value
Mean	46.90	36.06	39.46	41.66	45.50	6.07 S
SD	8.79	12.41	9.77	8.54	7.91	

Level of significance of F-value at 0.05 level = 2.60

The mean value of Balance of 10 Yrs girls for Trial-1, Trial-2, Trial-3, Trial-4 and Trial-5 were 46.90, 36.06, 39.46, 41.66 and 45.50 respectively and the SD values were 8.79, 12.41, 9.77, 8.54 and 7.91 respectively. Comparing the mean and SD values in five trials there were some differences among the values were observed. To observe the significant difference, the 'F' value was calculated and found to be 6.07 which was significant.

The mean and SD of the five trials in Balance for 10 years girls are also presented in Fig. 2.

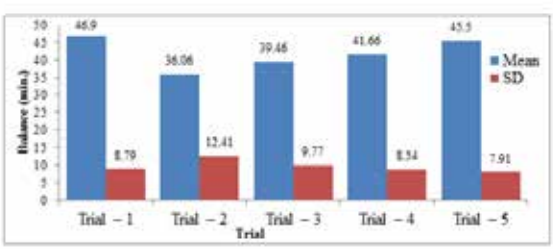

Fig. 2 : Showing Mean and SD of Balance of 10 years girls in five trials

To observe the difference between groups the critical difference (CD) value was calculated and found to be 5.0.

Table No. 3
Represents the difference between two means of Balance of 10 years girls in five trials

Trial	T_1	T_2	T_3	T_4	T_5
T_1		0.16	3.56	5.76	9.60*
T_2			3.40	5.60*	9.44*
T_3				2.20	6.04*
T_4					3.84
T_5					

* denotes Significant Value, Significant CD value = 5.0

The mean difference in Balance for 10 years girls between T_1 vs. T_2, T_1 vs. T_3, T_1 vs. T_4, were 10.84, 7.44, 5.24 respectively. All mean difference were significant but the mean difference between Trial-1 vs Trial-5 was found 1.40 which was not significant but the other mean difference between Trial-2 vs Trial-3 which was found 3.40 not significant. but the mean difference between Trial-2 vs Trial-4 and Trial-2 vs Trial---------- were significant and 3.40, 5.60 and 9.44 which were the mean difference between T_2 vs. T_3, T_2 vs. T_4 and T_2 vs. T_5. Among them the mean difference between T_2 vs. T_3, 3.40 was not significant but other mean differences were significant. The mean difference of T_3 vs. T_4 and T_4 vs. T_5 were 2.20 and 3.84 which were not significant but T_3 vs. T_5 was 6.04 which was significant comparing with CD value 5.0. Table No. 110 represented the Balance performance of 10 years girls. It showed that the girls had performed their Balance significantly and they had proved it trial after trial.

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