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Effect of Asanas and Pranayama on VO_2 Max among Down Syndrome Students

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Abstract

Effect of asanas and pranayamaononVO$_2$ max (maximum oxygen uptake)in sixty students belonging to 15 to 18 years of age affected with Down syndrome was examined. The subjects were grouped into Group Iand Group II consisting of thirty students each. Asanas and pranayama practice were assigned for twelve weeks to the Group II. There was no Asanas and pranayama on programme assigned to Group I. All the data were collected before and after the test through Harvard step test and subjected to statistical analysis using't' ratio. The study revealed that the practice of asanas and pranayama significantly improved the VO$_2$ maxin Down syndrome students.

Keywords: Asana, Pranayama, VO2 Max, Down Syndrome Syndrome.

Introduction

Children affected with disabilities such as Down syndrome could experience delay in learning things at a slower pace than the other children of similar age groups. Therefore it is essential that the students with developmental disabilities have to be trained with special educational procedures repeatedly, but at a slower rate. Presence of an extra 21 chromosome in a child can leads to a congenital disorder with characteristic features like mild to moderate mental retardation. Down syndrome is one of the common chromosomal abnormalities causing mild to severe mental retardation and other physical problems including heart defects. The Trisomy 21 is a congenital disorder with a typical facial appearance, mental retardation on with other signs of chromosomal abnormalities.

The disability affects the mental attitudes of the affected persons leading to have a lack confidence and a poor self-image. They develop inferiority feelings from their awareness of their own abnormality and lack of success in all directions. The inability to do simple things or performing with immense difficulty or not doing things at all resulting in frustration, subsequently result in a state of high tension and they tire easily from physical exertion. In addition to the lack concentration, the affected individuals have a stiff spine producing much pain and limit their movement, imbalances co-ordination movements. VO_2 max (Maximum Oxygen Consumption) is the maximum volume of oxygen that by the body can consume during intense, whole-body exercise, while breathing air at sea level expressed as ml/kg/min. It is an indirect way of measuring an individual's maximal capacity to do work aerobically because the oxygen consumption is linearly related to energy expenditure.

Yoga is considered one of the six schools of ancient Indian Philosophy and the practice of yoga help the individuals to achieve higher levels of performance and also brings out the hidden potentials. A Systematic approach and practices of Yoga could increase the physiological and psychological wellbeing of individuals. There are many postures beneficial to 'differently abled' children even though some of the poses of yoga are difficult to practice by them. The major disabilities include physical, cognitive, mental, sensory, emotional and developmental or some combination of these of congenital or acquired nature. Krishna, (1998) reported that, Asanas could provide the means for people of any age to get and stay in shape, balance, coordination, and a sense of centeredness. It was also reported that, practice of yoga could direct the blood and oxygen to the internal organs including the glands and nerves. Doijadet al. (2013) reported that one hour daily yogic exercises including asanas, breathing exercises and pranayama could improve VO2 max.

Hence the present study was conducted to evaluate the effect of 12 weeks practice of asanas and pranayama on VO_2 maxamong Down syndrome students. It was hypothesized that 12 weeks practice of asanas and pranayama would produce significant improvement in VO_2 max among Down syndrome students.

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Methodology

The present study was conducted to evaluate the effect of 12 weeks practice of asanas and pranayama on VO_2 max among Down syndrome students. Sixty Down syndrome students age ranged between 15and 18years were selected at random from Pratheeksha Special School, Mukkam, Kozhikode District, Kerala. The subjects were grouped into Group I as control and Group II as experimental group consisting of thirty students each. Asanas and pranayama practice were assigned for twelve weeks to the Group II whereas no asanas and pranayama training was assigned to Group I.Asanas and pranayama were practiced by the experimental group for 45 to 50 minutes with a five minutes warm up. After that Ardhakattichakrasana, Pathahasthasana, Trikonasana, Vajrasana, Ustrasana, Sasangasana, Parvathasana, Bhujangasana, shalabhasana, nadisuddhi pranayama, anuloma, viloma and finally savasana were practiced. Harvard step test was used to measure the VO_2 max of the subjects and the score was recorded in ml/kg/min..

The procedure of Harvard Step test for short form of the test was carried out by counting the total number of heart beats between 1 to 1.5 minutes following the completion of the each exercise test, but the long form of the test include an additional heart rate measure at between 2 to 2.5 minutes and 3 to 3.5 minutes.

Results and Discussion

The study was conducted to evaluate the effect of asanas and pranayamato VO_2 max before and after the training period among Down syndrome students and the observations obtained were subjected to statistical analysis using‘t’ ratio at 0.05 level of significance. The results obtained from the study regarding VO_2 max are presented in the table.

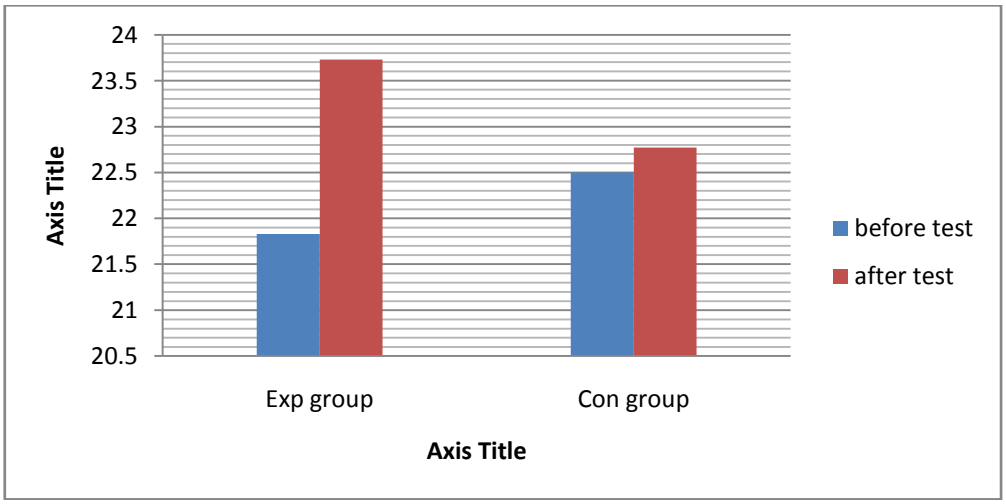
Table 1
Computation of‘t’ ratio on VO_2 max

Group	Before the test (Mean ± S. D)	After the test (Mean ± S. D)	‘t’ ratio
Group I - Control Group	22.50 ±2.92	22.77± 3.18	1.39
Group II, Experimental Group	21.83 ±2.98	23.73±2.95	12.32*

* Significant at 0.05 levels

The result of the study revealed that the ‘t’ ratio on VO_2 max of Group II, Experimental Group was12.32. The value VO_2 max of Group II, was 12.32 which is higher than the required table value of 2.045. It was also found that the value is statistically significant at 0.05 level. The finally obtained ‘t’ ratio between pre and post test of Group I, control group was 1.39 which is non significant and lesser than the required table value of 2.045. This significant improvement might be due to the effect of 12 weeks of asanas and pranayama practices on experimental group. The results of this study indicated that there was an improvement in VO_2 max of the subjects (experimental group) after 12 weeks practice of asanas and pranayama. So the hypothesis was proved and accepted. These findings of the present study are in agreement with the studies conducted by Barman (2016), Chowdhary & Das (2015) and Palpandi & Radhakrishnan (2016).

Figure I
Mean values of VO_2 max for Group I & II



Conclusion

With the limitation of the study, the following conclusion was drawn. Results of the study indicated that practice of asanas and pranayama improved the VO_2max (Maximum Oxygen Consumption)of Down syndrome students.

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