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Effect of twelve weeks yogic pranayama on cardiovascular endurance among intellectually disable persons

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Abstract

The purpose of the study was to find out the effects of twelve weeks Yogic Pranayama on cardiovascular endurance among Intellectually Disable persons. The study has been conducted on 30 students (males and females) which were equally divided into experimental group and control group. The subjects were students of B.B. Paul Mental Development Home, Mongshangei Lai Leirak, Imphal West with age ranged between 18-25 years. The study was restricted to only Cardiovascular Endurance (9 mins run/walk test) in which both experimental and control group were assessed on the first day and after 12 weeks. The subjects of experimental group underwent a training of yogic pranayama practices for 12 weeks. To find out significant difference between the group, 't' test was used with the help of SPSS Software. The level of significance chosen was 0.05. The result of within group comparison revealed significant improvement in cardiovascular endurance in subjects of pranayama group however no change was observed in control group. No significant difference was found between the pre-test of experimental and control group whereas there was significant difference observed between the two groups in post-test. The present study demonstrated that 12 weeks of yogic pranayama is effective for improving cardiovascular endurance of intellectually disabled children.

Keywords: Pranayama, cardiovascular endurance, intellectually disable persons

Introduction

Intellectual disability is described as significantly sub average general intellectual functioning, existing concurrently with deficits in adaptive behaviour and manifested during the developmental period that adversely affects a child's educational performance (Ashutosh, 2015) ^[1]. Individuals with intellectual disabilities (ID) are significantly at-risk for becoming overweight or obese, according the centres for disease control (CDC). Cardiovascular Endurance is the ability of heart and lungs to take in and to transport adequate amount of oxygen to the working muscles for activities (that involves large muscle masses), to be performed over long periods of time (Fox *et al.*, 1993) ^[3].

Pranayama practices, stretches the lung tissue producing inhibitory signals from action of slowly adapting receptors and hyperpolarising currents. These inhibitory signals coming from cardio respiratory region involving vagi are believed to synchronize neural elements in the brain leading to changes in the autonomic nervous system; and a resultant condition characterized by reduced metabolism and parasympathetic dominance (Jerath *et al.*, 2006) ^[7]. Pranayama modified various inflatory and deflatory lung reflexes and interact with central neural element to bring new homeostasis in the body (Tandon, 2012) ^[10].

Waghmare and Baji (2013) ^[12] concluded in their study that regular practice of pranayama mainly improves respiratory efficiency as seen by highly significant in respiratory parameters. It also improves cardiac efficiency as indicated by significant decrease in pulse rate & highly significant increase in 40 mmHg endurance time. This increase in cardio respiratory efficiency is result of multiple factors, regularly and is associated with Yogasanas & mediation, the cardiac efficiency can be improved to a greater extent. By extending these results, it can be suggested that pranayama practice may be applied as an adjunct to conventional therapy in

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diseases like bronchial asthma, chronic bronchitis, COPD. Chow *et al.*, (2018) [2] conducted a study on intellectually disabled grown-ups in the shelter homes of Hong Kong. He studied the impact of physical activity and physical fitness of such group. In the study, Physical Fitness (health-related physical fitness) and Physical Activity (routine physical activity) were described for moderate and mild intellectually disabled who stayed and worked in 4 groups in such homes of Hong Kong. Total 114 grown-ups having minor and moderate Intellectual Disabilities were evaluated on Physical Fitness tests (such as body fat percent, 6-minute walk, hip and waist circumferences, arm curl, and sit and reach). They concluded that individuals with intellectual disability who were staying in group homes undertake less physical activity and have low fitness levels. The study found that cardiovascular fitness (walking test) was very effective among subjects between fitness.

The use of yoga for rehabilitation has diverse applications. Yoga practice benefited mentally handicapped subjects by improving their mental ability, also the motor co-ordination and social skills (Telles & Naveen, 1997) [11].

The present study was conducted on mild and moderate intellectually disabled persons, aiming to deepen our understanding of their cardio-vascular endurance with response to Yogic pranayama practices. The finding of this study will be of great significance to the general public as well as to the differently abled persons specially, those with intellectually disabled and it will also help to bring out awareness of the relevance of yogic practices in the modern world.

The study will be of benefits to coaches, doctors, health experts, players and differently abled persons of the society. It will also prove significant to those people who wish to attain and maintain good healthy living.

Objective of the Study

To find out the effect of 12 weeks Yogic Pranayama training program on cardiovascular endurance among intellectually disable persons.

Materials and Methods

The study has been conducted on 30 students (males and females) which were equally divided into two groups i.e., experimental and control group. The subjects were students of B.B. Paul Mental Development Home, Mongshangei Lai Leirak, Imphal West. The age of the subjects ranged between 18-25 years. The study was restricted to only cardiovascular endurance i.e., 9-minute Run/Walk test. 12 weeks Yogic Pranayama training was given for 1 hour for six days in a week to the experimental group. The training included loosening exercises, Surya Namaskar, Ujjayi Pranayama, Kapalbhathi, Bhastrika, Sitali Pranayama, Sitkari Pranayama, Anuloma-Viloma and Bhamari Pranayama. To find out significant difference between the group ‘t’-test was used the help of SPSS Software. The level of significance chosen was 0.05.

Findings and Discussion

The comparison of pre-test and post-test for control group on cardiovascular endurance is represented in Table 1.

Table 1: Comparison of Paired ‘t’-test scores of pre-test and post-test for control group on cardiovascular endurance

Variable	Group	N	Mean	SD	SEM	MD	SED	t-value
Cardiovascular Endurance	Pre-test	15	540.60	120.98	31.24	2.48	11.22	0.86
	Post-test	15	543.08	122.39	31.60			

*Significance at .05 level

t’_{0.05} (28) = 2.04

In the above table-1 the significance of difference between Pre-test and Post-test of the mean (M) and standard deviation (SD) of control group for the cardiovascular endurance test (9-minute Run/Walk Test) were shown. The mean of pre-test and post-test of control group were 540.60±543.08 and standard deviation were 120.98±122.39 respectively. In

addition, the standard errors of pre and post-test were also found as 31.24 and 31.60 respectively. The analysis calculated paired ‘t’ value of control group was found not to be significance different as the value obtain was 0.86, whereas tabulated value was 2.04 with 28 degrees of freedom at 0.5 level of significance.

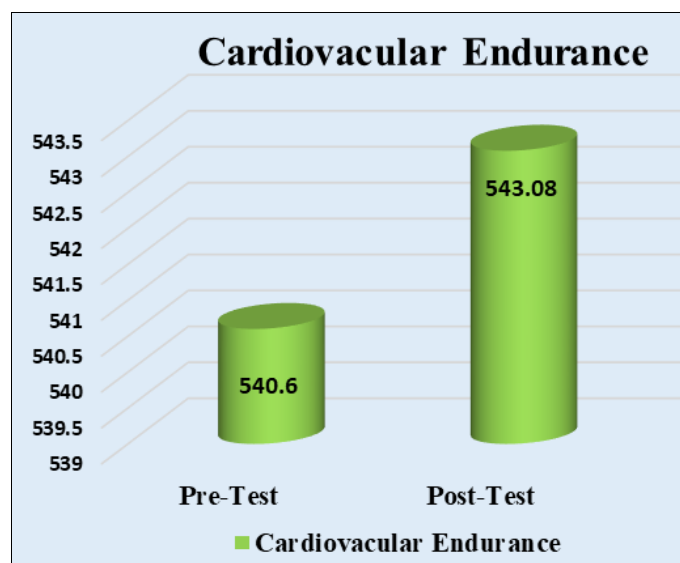


Fig 1: The Graphical Representation of mean scores of pre-test and post-test of control group on cardiovascular endurance

The comparison of pre-test and post-test for experimental group on cardiovascular endurance is represented in Table 2.

Table 2: Comparison of Paired ‘t’-test scores of pre-test and post-test for experimental group on cardiovascular endurance

Variable	Group	N	Mean	SD	SEM	MD	SED	t-value
Cardiovascular Endurance	Pre-test	15	584.44	152.98	39.50	106.92	119.56	3.46*
	Post-test	15	691.37	160.87	41.54			

*Significance at .05 level

$t'_{0.05} (28) = 2.04$

In the above table-2, the significance of difference between Pre-test and Post-test of the mean (M) and standard deviation (SD) of experimental group for the Cardiovascular Endurance Test (9 mins Run/Walk Test) were shown. The mean of pre-test and post-test of experimental group were 584.44±691.37 and standard deviation were 152.98±160.87 respectively. In

addition, the standard errors mean of pre and post-test were also found as 39.50 and 41.54 respectively. The analysis calculated paired ‘t’ value of experimental group was found to be significance different as the value obtain was 3.46, whereas tabulated value was 2.04 with 28 degree of freedom at 0.5 level of significance.

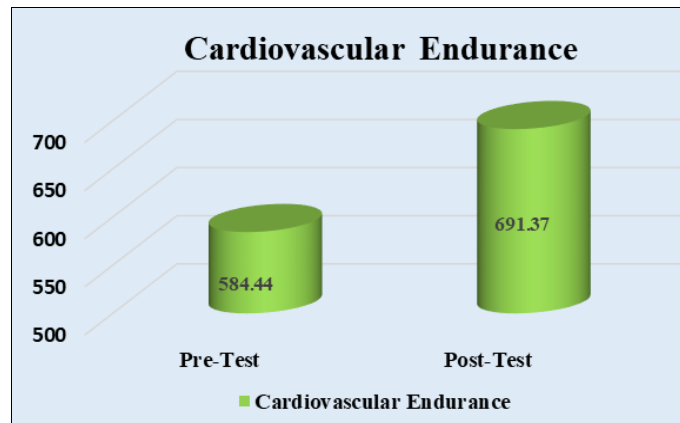


Fig 2: The Graphical Representation of Mean Scores of Pre-Test and Post-test of Experimental Group on Cardiovascular Endurance

The comparison of Pre-Test Scores on Cardiovascular Endurance between Experimental and Control Group is presented in Table-3.

Table 3: Comparison of Pre-Test scores on Cardiovascular Endurance between Experimental and Control Group

Variable	Group	N	Mean	SD	SEM	MD	SED	t-value
Cardiovascular Endurance	Experimental	15	584.44	152.98	39.50	43.84	50.36	0.87
	Control	15	540.60	120.98	31.24			

*Significance at .05 level

$t'_{0.05} (28) = 2.04$

A glance at the results depicted in table-3 showed that the Pre scores of Experimental and Control Group on mean were 584.44 and 540.60 whereas SD scores were 152.98 and 120.98 respectively. The t-value was found not to be

statistically significant as the value obtained was 0.87, whereas the tabulated value was 2.04 with 28 degrees of freedom at .05 level of significance.

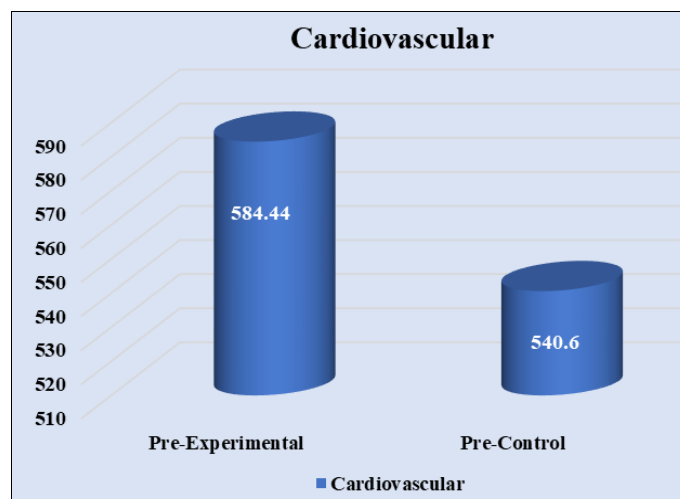


Fig 3: The Graphical Representation of Mean Score between Pre-Experimental and Pre-Control Group on Cardiovascular Endurance

The comparison of post-test scores on cardiovascular endurance between experimental and control group is presented in Table-4.

Table 4: Comparison of post-test scores on cardiovascular endurance between experimental and control Group

Variable	Group	N	Mean	SD	SEM	MD	SED	t-value
Cardiovascular Endurance	Experimental	15	691.37	160.87	41.54	148.28	52.19	2.84*
	Control	15	543.08	122.39	31.60			

*Significance at .05 level

$t'_{0.05} (28) = 2.04$

A glance at the results depicted in table-4 showed that the post scores of experimental and control group on mean were 691.37 and 543.08 whereas SD scores were 160.87 and 122.39 respectively. The t-value was found to be statistically

significant as the value obtained was 2.84, whereas the tabulated value was 2.04 with 28 degrees of freedom at .05 level of significance.

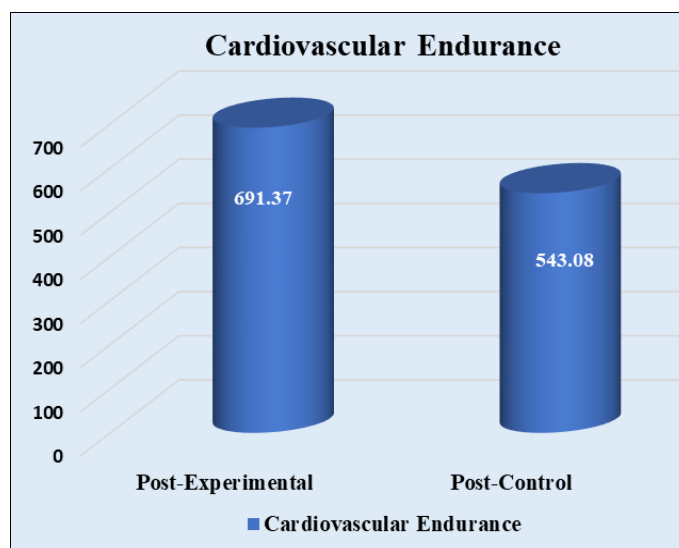


Fig 4: The Graphical Representation of Mean Scores between Post-Experimental and Post-Control Group on Cardiovascular Endurance

Discussion

From the above results of the study, the experimental (Pranayama) group has better performance as compared to the control group in terms of cardiovascular endurance. Yogic exercise mainly the pranayama is one of the best tonics for developing cardio respiratory endurance and its related responses (Gulhane and Rane, 2015) [6]. (Ganguly, Gharoti and Jolly, 1981) [4] with a view to see the immediate effect of Kapalabhati on cardio respiratory endurance & observed a significant improvement in the cardio vascular endurance after performing one-minute of Kapalabhati as compared to hyperventilation of similar duration. (Gharote & Ganguly, 1973) [5] Cardiovascular fitness plays a vital role in the maintenance by proper health and physical fitness. The purpose was to determine the effect of long-term yogic training program on cardio-vascular efficiency, Harvard-step test was administered to 11 male students and results of the study indicated that one hour of daily yogic exercise including pranayama schedule significantly improved cardio vascular efficiency of the student. Nandhi and Adhikari (1999) [8] conducted a study on the effect of yogic practices on cardio-respiratory endurance of 20 school boys using Coopers12-minute Run/ Walk test. During the experimental period the subject were given yogic exercise for a period of 8 weeks. The data showed a significant improvement in the fitness test as a result of yogic practices. Papola (2013) [9] also showed that the cardiovascular endurance was significantly improved due to the training of Kapalabhati pranayama.

Conclusion

In the light of the findings and limitations of the present study

the following conclusions were drawn:

- In case of control group, no significant difference was obtained on cardiovascular endurance between pre-test and post-test.
- A significant difference was obtained on cardiovascular endurance between pre-test and post-test among Experimental Group. No significant difference was found in the pre-test between Experimental and Control Group.
- There was significant difference between experimental and control group in the post-test. Twelve weeks of Yogic Pranayama is effective for improving cardiovascular endurance of intellectually disabled children.

References

1. Ashutosh. Diagnostic study of perceptual motor coordination between children with mild intellectual disability and intellectual children. Unpublished M. Phil. Dissertation; c2015.
2. Chow BC, Choi P, Huang W. Physical activity and physical fitness of adults with intellectual disabilities in group homes in Hong Kong. *Int. J Environ. Res. Public Health*. 2018;15(7):1370.
3. Fox E, Bowers R, Fross M. *The physiological basis for exercise and sports*. Wisconsin, U.S.A.: W.C.B. Brown and Benchmark Publishers; c1993.
4. Ganguly SK, Gharoti ML, Jolly K. Immediate effect of Kapalabhaati on cardio respiratory endurance. *Yoga Mimansa*. 1981;28(1):1-7.
5. Gharote ML, Ganguly SK. Effect of yogic training on physical fitness. *Yoga Mimansa*. 1973;XV:31-35.

6. Gulhane VP, Rane PW. Effect of Pranayama on status of cardio respiratory endurance in the college students. *Int. Res. J Phys. Educ. Sports Sci.* 2015;2(2):1-6.
7. Jerath RJ, Edry VA, Barnes VA, Jerath V. Physiology of long pranayamic breathing: Neural respiratory elements may provide a mechanism that explains how slow breathing shifts the autonomic nervous system. *Med. Hypotheses.* 2006;67:566-571.
8. Nandhi S, Adhikari H. The effects of selected yogic practices on cardio respiratory endurance of school boys. In: *Abstracts 3rd. International Conference Yoga Research and Tradition; c1999.* p. 14.
9. Papola HS. Effect of Kapalabhati Pranayama on cardiovascular endurance. *Int. J Res. Pedagogy Technol. Educ. Movement Sci. (IJEMS).* 2013;2(2):91-96.
10. Tandon OP, Tripathi Y. Yoga and its applications. In: *Best and Taylor's Physiological Basis of Medical Practice.* 13th ed.; c2012. p. 1217-1230.
11. Telles S, Naveen KV. Yoga for rehabilitation: An overview. *Indian J Med. Sci.*; c1997.
12. Waghmare P, Baji PS. Effect of pranayama on cardio-respiratory efficiency. *Indian J Basic Appl. Med. Res.* 2013;2(8):918-922.