

IMPACT OF YOGIC PRACTICES ON CARDIOVASCULAR ENDURANCE IN INDIVIDUALS WITH INTELLECTUAL DISABILITIES

Keisham Monarita¹
Prof. Thingnam Nandalal Singh²,
Khumukcham Shivananda Singh³,
Rastam Thingnam⁴

^{1,3&4}Research Scholar, Department of Physical Education, Panjab University, Chandigarh

²Department of Physical Education, Panjab University, Chandigarh

Received: 10th July, 2025

Revised & Accepted: 15th November, 2025

Published: 25th December, 2025

DOI: <https://doie.org/10.65985/AS.2026763643>

Abstract: The present study aimed to find out the Impact of Yogic Practices on Cardiovascular Endurance in Individuals with Intellectual Disabilities. The study was conducted on 30 intellectually disabled students (males and females) who were equally divided into an experimental group and a control group. The subjects were students of B.B. Paul Mental Development Home, Mongshangei Lai Leirak, Imphal West with age ranging 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 the experimental group underwent a training of yogic practices (both asanas and pranayama) for 12 weeks. To find out the significant difference between the groups, 't' test was used with the help of SPSS Software. The level of significance was chosen as 0.05. The analysis of the within-group comparisons indicated a notable enhancement in cardiovascular endurance among participants in the yogic group, while no changes were seen in the control group. There were no significant differences detected between the pre-test results of the experimental and control groups; however, a significant difference was noted between the two groups in the post-test. This study showed that a 12-week program of yogic practice effectively improves cardiovascular endurance in individuals with intellectual disabilities.

Keywords: *Yoga, Cardiovascular Endurance, Intellectually Disabled Persons, Asana, Pranayama*

Introduction:

Having cardiovascular endurance is integral for heart health. Aerobic activities that build cardiovascular endurance help control several heart disease risk factors including high cholesterol, high blood pressure, and obesity.

Intellectual disability (ID) 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). It is observed that people with ID run high risk of obesity and other related health disorders (Emerson & Robertson, 2010). Long-term inactivity creates further health problems such as diabetes mellitus, respiratory disorders, and metabolic syndrome. All these physical and health problems negatively affect the general quality of life of a person with ID (Overwijk et al., 2022). They develop age-related health issues even in the earlier stages of life (Wouters et al., 2019). Individuals with intellectual disabilities (ID) are significantly at risk for becoming overweight or obese, according to the Centres for Disease Control (CDC). Cardiovascular Endurance is the ability of the heart and lungs to take in and transport an adequate amount of oxygen to the working muscles for activities (that involve large muscle masses),

to be performed over long periods of time (*Fox et al., 1993*). Individuals with intellectual disabilities are at a significantly higher risk of developing cardiovascular diseases, including ischemic stroke, heart failure, and hypertension. These risks are exacerbated by sedentary lifestyles, lower physical activity levels, and barriers to accessing tailored exercise programs (*Jacinto et al., 2023*).

Asana involves controlled movements, breathing techniques, and mindfulness, making it a low-impact yet effective form of exercise. Specific asanas, such as Surya Namaskar (Sun Salutation), Virabhadrasana (Warrior Pose), and Tadasana (Mountain Pose), can enhance cardiovascular endurance by improving blood flow and oxygenation, both of which are essential for cardiovascular health. Further Asana practice reduces cortisol levels, promoting heart health, which reduces stress (*Bouzas et al., 2018*).

Pranayama practices stretch the lung tissue producing inhibitory signals from action of slowly adapting receptors and hyperpolarising currents. These, inhibitory signals coming from the cardiorespiratory 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*). Pranayama modified various inflatory and deflatory lung reflexes and interact with central neural elements to bring new homeostasis to the body (*Tandon, 2012*).

Children with intellectual disabilities may experience challenges in bodily awareness, perceptual-motor development, and coordination. However, with appropriate stimulation, they can achieve significant advancements in both psychomotor and motor skills (*Silvia & Ofelia, 2013*). Yoga Therapy has emerged as an effective therapeutic approach in supporting the rehabilitation of children with intellectual disabilities (*Uma et al., 1989*). The application of yoga in this context has shown diverse benefits, including enhancements in mental capacity, motor coordination, and social skills among individuals with intellectual challenges (*Telles & Naveen, 1997*).

Cardiovascular endurance is a critical component of physical fitness, particularly for individuals with intellectual disabilities (ID), who often face higher risks of cardiovascular diseases (CVD) and related health complications (*Cho et al., 2024*). Asana, a key element of yoga, has gained recognition for its potential to enhance physical and mental well-being (*Wang et al., 2023*). This article explores how yogic practice can improve cardiovascular endurance in individuals with intellectual disabilities.

Objective of the Study:

To find out the impact of yogic practices on cardiovascular endurance in individuals with intellectual disabilities.

Materials and Methods:

The study was conducted on 30 students (males and females) who were equally divided into two groups i.e., experimental and control groups. 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., a 9-minute Run/Walk test. 12 weeks of Yogic training (both asanas and pranayama) was given for three days a week to the experimental group. The training included Surya namaskar, loosening exercises, tadasana, trikonasana, paschimotanasana, bhumasana, ustrasana, pavanmuktasana, halasana, bhujangasana, naukasana, dhanurasana, shavasana, anuloma-viloma, bhamari pranayama, and kapalbhati. To find out the significant difference between the group 't'-test was used with the help of SPSS Software. The level of significance chosen was 0.05.

Findings and Discussions:

The comparison of the 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.

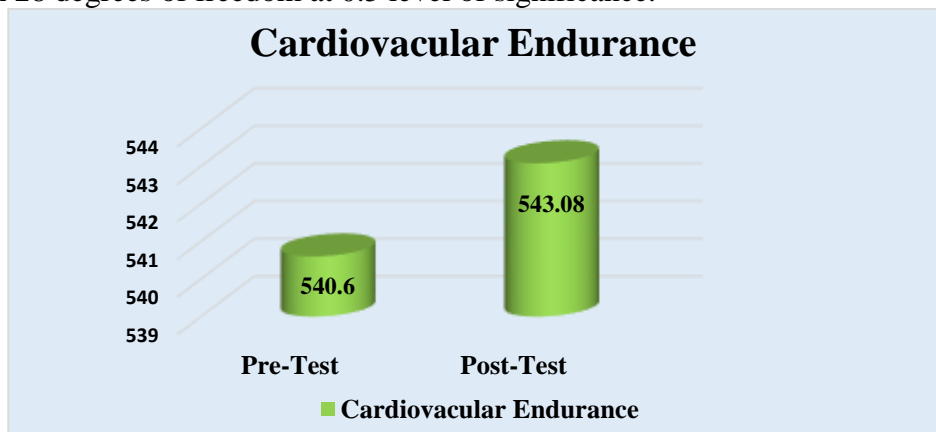


Fig-1: The Graphical Representation of Mean scores of Pre-Test and Post-Test of Control Group on Cardiovascular Endurance

The comparison of the pre-test and post-test for the 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	584.31	114.55	29.58	235.46	89.72	10.16*
	Post-test	15	819.77	176.45	45.56			

*Significance at .05 level
 $t'_{0.05} (28) = 2.04$

In the above table-2, the significance of the difference between the Pre-test and Post-test of the mean (M) and standard deviation (SD) of the experimental group for the Cardiovascular Endurance Test (9 mins Run/Walk Test) were shown. The mean of the pre-test and post-test of the experimental group were 584.31 and 819.77 and the standard deviation were 114.55 and 176.45 respectively. In addition, the standard error mean of pre and post-test were also found to be 29.58 and 45.56 respectively. The analysis calculated paired ‘t’ value of the experimental group was found to be significantly different as the value obtained was 10.16, whereas the tabulated value was 2.04 with 28 degrees of freedom at 0.5 level of significance.

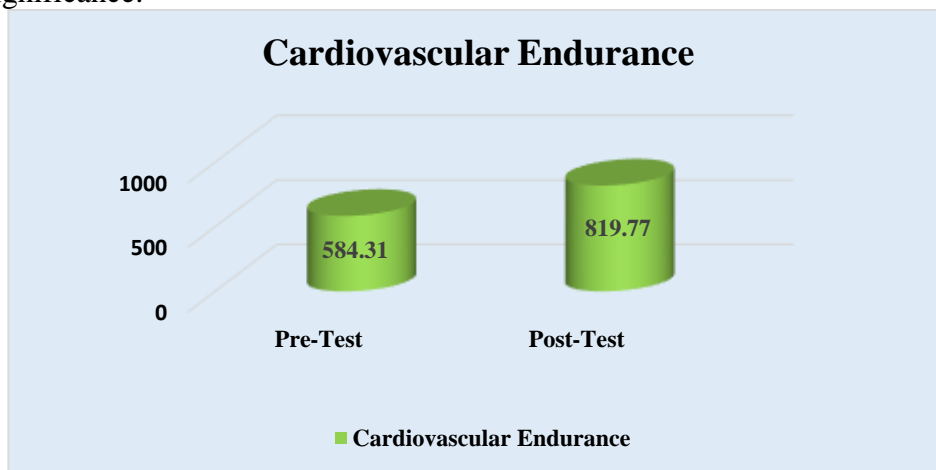


Fig: 2: The Graphical Representation of Mean Scores of Pre-Test and Post-test of Experimental Group on Cardiovascular Endurance

The comparison of Pre-Test Scores on Cardiovascular Endurance between Experimental and Control Groups 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	584.31	114.55	29.58	43.71	43.02	1.02
	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 584.31 and 540.60 whereas SD scores were 114.55 and 120.98 respectively. The t-value was found not to be statistically significant as the value obtained was 1.02, whereas the tabulated value was 2.04 with 28 degrees of freedom at .05 level of significance.

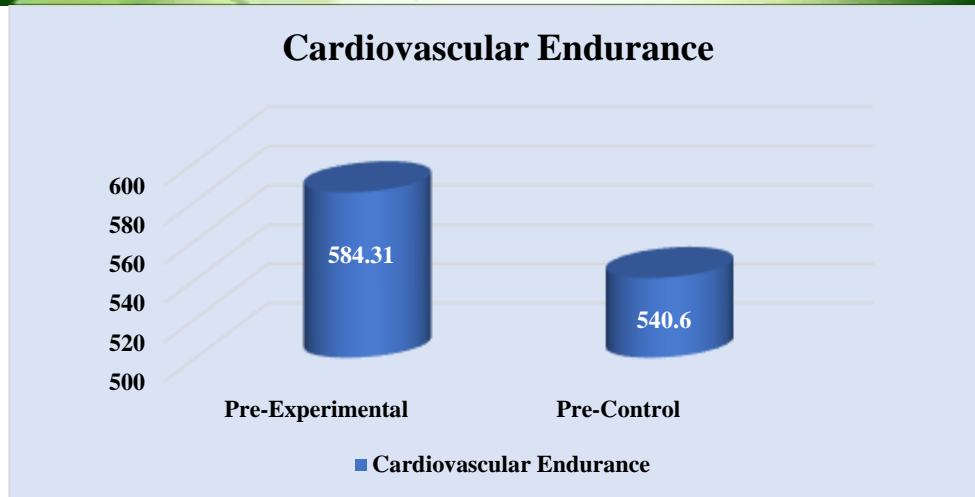


Fig: 3: The Graphical Representation of Mean Score between Pre-Experimental and Pre-Control Group on Cardiovascular Endurance

The comparison of post-test scores on cardiovascular endurance between experimental and control groups 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	819.77	176.45	45.56	276.69	55.45	4.99*
	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 the experimental and control group on mean were 819.77 and 543.08 whereas SD scores were 176.45 and 122.39 respectively. The t-value was found to be statistically significant as the value obtained was 4.99, whereas the tabulated value was 2.04 with 28 degrees of freedom at .05 level of significance.

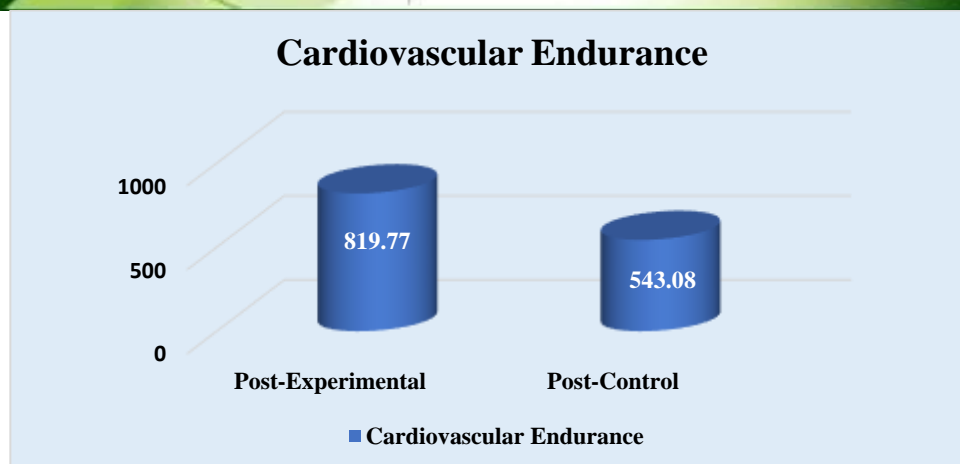


Fig-4: The Graphical Representation of Mean Scores between Post-Experimental and Post-Control Group on Cardiovascular Endurance

DISCUSSIONS

The findings of this study demonstrate a significant improvement in cardiovascular endurance among individuals with intellectual disabilities (ID) following a 12-week yogic intervention. This aligns with previous research indicating that yogic practices, can enhance cardiovascular fitness in diverse populations, including those with ID. The integration of specific breathing techniques, such as Kapalabhati and Ujjayi pranayama, likely contributed to the observed improvements by enhancing respiratory efficiency and promoting better oxygenation of the blood, which are critical for cardiovascular health (Yuvaraj et al., 2024). This is consistent with findings from other studies that have highlighted the role of yoga in improving cardiorespiratory efficiency and overall physical fitness in diverse populations, including those with intellectual disabilities (Reina et al., 2020). Nandhi and Adhikari (1999) carried out a study to investigate the impact of yogic practices on the cardiorespiratory endurance of 20 schoolboys, employing the Cooper 12-Minute Run/Walk test. Throughout the eight-week experimental period, the participants engaged in yogic exercises. The findings revealed a significant enhancement in their fitness test outcomes attributable to the implementation of these yogic practices. Papola (2013) also showed that cardiovascular endurance was significantly improved due to the training of Kapalabhati pranayama.

Further yogic practice positively influences heart rate variability in young female adults with ID, potentially enhancing autonomic nervous system function and overall well-being. Implementing yoga programs tailored to the specific needs of individuals with ID may represent a valuable strategy for improving their physical and mental health (Karlekar et al., 2024).

Conclusions

In light of the findings and limitations of the present study the following conclusions were drawn:

- In the case of the control group, no significant difference was obtained in cardiovascular endurance between the pre-test and post-test.
- A significant difference was obtained in cardiovascular endurance between pre-test and post-test among the Experimental Group. No significant difference was found in the pre-test between the Experimental and Control Groups.
- There was a significant difference between the experimental and control group in the post-test. Twelve weeks of Yogic Practices (both asana and pranayama) is effective for improving cardiovascular endurance in individuals with intellectual disabilities.

References

1. Ashutosh (2015). Diagnostic Study of Perceptual Motor Coordination between Children with Mild Intellectual Disability and Intellectual Children. Unpublished M. Phil. Dissertation.
2. Bouzas, S., Martinez-Lemos, R. I., & Ayan, C. (2018). Effects of exercise on the physical fitness level of adults with intellectual disability: a systematic review. *Disability and Rehabilitation*, 41(26), 3118–3140.
3. Cho, I. Y., Koo, H. Y., Um, Y. J., Park, Y. M., Kim, K. M., Lee, C. E., & Han, K. (2024). Intellectual Disabilities and risk of cardiovascular diseases: a population-based cohort study. *Disability and Health Journal*, 101754.
4. Emerson, E., & Robertson, J. (2010). Obesity in young children with intellectual disabilities or borderline intellectual functioning. *International Journal of pediatric obesity: IJPO: an official journal of the International Association for the Study of Obesity*, 5(4), 320–326.
5. Fox, E., Bowers, R., & Fross, M. (1993). *The Physiological Basis for Exercise and Sports*. W.C.B. Brown and Benchmark Publishers, Wisconsin, U.S.A.
6. Jacinto, M., Matos, R., Monteiro, D., Antunes, R., Caseiro, A., Gomes, B., Campos, M. J., & Ferreira, J. P. (2023). Effects of a 24-week exercise program on anthropometric, body composition, metabolic status, cardiovascular response, and neuromuscular capacity, in individuals with intellectual and developmental disabilities. *Frontiers in Physiology*, 14.
7. Jerath, R. J., Edry, V. A., Barnes, V. A., & Jerath, V. (2006). Physiology of long pranayamic breathing: Neural respiratory elements may provide a mechanism that explains how slow breathing shifts the autonomic nervous system. *Med Hypotheses*; 67:566–571.
8. Karlekar, S., Jayasingh Albert Chandrasekar, S., Pramanik, M., Elayaraja, M., Prasad, S., Pramanik, T. N., Marwah, K., Mehta, V., Gogoi, H., & Govindasamy, K. (2024). Effect of yoga practice on heart rate variability in healthy young adults with intellectual disability. *Fizjoterapia Polska*, 24(2), 183–189.
9. Overwijk, A., Hilgenkamp, T. I. M., van der Schans, C. P., Krijnen, W. P., Vlot-van Anrooij, K., van der Putten, A. A. J., & Waninge, A. (2022). Implementation of a program to support direct support professionals to promote a healthy lifestyle for people with moderate to profound intellectual disabilities. *BMC health services research*, 22(1), 15.
10. Papola, H. S. (2013). “Effect of Kapalabhati Pranayama on Cardiovascular Endurance”. *International Journal of Research Pedagogy and Technology in Education and Movement Sciences (IJEMS)*, 2(2), 91-96.
11. Reina, A., Adams, E., Allison, C., Mueller, K., Crowe, B., Puymbroeck, M., & Schmid, A. (2020). Yoga for functional fitness in adults with intellectual and developmental disabilities. *International Journal of Yoga*, 13(2), 156.
12. Silvia T. & Ofelia P. (2013). Aspects on the motor and psychomotor development of the child with intellectual disabilities. *Sci Movem Health*; 13: 551–557.
13. Tandon, O. P., & Tripathi, Y. (2012). Yoga and its applications. *Best and Taylor's Physiological Basis of Medical Practice*. 13th ed, pp:1217–1230.
14. Telles, S., & Naveen, K. V. (1997). Yoga for rehabilitation: an overview. *Indian Journal of Medical Sciences*.
15. Uma K., Nagendra H. R., Nagarathna R., Vaidehi S. & Seethalakshmi R. (1989). The integrated approach of yoga: A therapeutic tool for mentally retarded children: a one year-controlled study. *J Ment Defic Res*;33(Pt 5):415-21.
16. Wang, H., Lee, P. M. Y., Zhang, J., Svendsen, K., Li, F., & Li, J. (2023). Association of intellectual disability with overall and type-specific cardiovascular diseases: a population-based cohort study in Denmark. *BMC Medicine*, 21(1).

17. Wouters, M., Evenhuis, H. M., & Hilgenkamp, T. I. M. (2019). Physical activity levels of children and adolescents with moderate-to-severe intellectual disability. *Journal of applied research in intellectual disabilities: JARID*, 32(1), 131–142.
18. Yuvaraj, D., Dibakar, D., Prem, K. G., Aravindh, M., Ramesh, A. J., & Alphi, G. S. (2024). Determining the Impact of Adapted Yoga Training on Physical Functioning in Students with Mild Intellectual Disability. *Physical Education Theory and Methodology*, 24(3), 351–358.