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EFFECT OF DIFFERENT INDIAN CLASSICAL DANCE FORM TRAINING ON PULMONARY FUNCTION IN INDIVIDUALS AGED 30-59 YEARS - A COMPARATIVE STUDY

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ABSTRACT

Indian classical dance integrates rhythmic movement with controlled breathing, offering potential benefits for respiratory function. This study aimed to compare the effects of Bharatanatyam, Kathak, and Odissi training on pulmonary function in adults aged 30 to 59 years. A total of sixty trained dancers, with 20 in each group and a minimum of one year of practice at least twice weekly, were recruited. Peak Expiratory Flow Rate (PEFR) was measured using a peak flow meter, while cardiopulmonary reserve was assessed by the Breath Holding Test (BHT). Data normality was examined using the Shapiro–Wilk test, and intergroup comparisons were performed using the non-parametric Kruskal–Wallis test. The results demonstrated significant differences in PEFR ($H = 7.268$, $p = 0.026$) and BHT ($p < 0.001$) across the three groups, with Odissi dancers achieving the highest values, followed by Bharatanatyam and Kathak. These findings indicate that variations in breathing techniques and movement intensity among dance forms influence pulmonary outcomes. In conclusion, Odissi and Bharatanatyam appear more effective than Kathak in enhancing respiratory efficiency. The study highlights the potential of Indian classical dance as a culturally enriching and enjoyable means of promoting pulmonary health in middle-aged adults, supporting its integration into wellness and rehabilitation programs.

Keywords: Indian classical dance, Pulmonary function, PEFR, Breath Holding Test, Respiratory efficiency, Community rehabilitation, Middle-aged adults.

INTRODUCTION:

There are seven major recognized forms of Indian classical dance: Kathak, Bharatanatyam, Manipuri, Odissi, Kathakali, Kuchipudi, and Mohiniattam. To various degrees, all these forms are rooted from the Natyashastra, a millennium old Sanskrit treatise on the performing arts, so they all share common features [1] Indian classical dance forms integrate specific breathing techniques into their routines. These dance forms incorporate breath control in coordination with intricate movements and rhythms. The practice also involves diaphragmatic breathing, which supports the body's oxygenation and promotes efficient lung function. This focus on breathing patterns lead to enhanced pulmonary function capacity over time, and dancers develop stronger

respiratory muscles and better control over their breath. Pulmonary function capacity refers to the ability of the lungs to move air in and out efficiently, allowing for proper gas exchange and oxygen delivery to the body's tissues. It encompasses several measures that evaluate different aspects of lung function, including the volumes of air that can be inhaled and exhaled, as well as the speed at which air can be moved. Pulmonary function capacity is a critical indicator of overall respiratory health and can be affected by various factors such as age, physical fitness, health conditions, and lifestyle choices. [2] [3] [4] The pulmonary and circulating system are responsible for sending blood to lungs and returning to heart and getting rid of waste products in our blood while helping to distribute blood rich in oxygen. [5] [6] [7] By exploring the physiological benefits of Indian classical dance, these dance forms can contribute positively to respiratory health. The combination of rhythmic movements and controlled breathing may offer potential therapeutic benefits and serve as a unique form of exercise to improve overall respiratory function. [8] Building on this evidence, the present study investigates whether different classical dance forms vary in their influence on pulmonary function, focusing specifically on Bharatanatyam, Kathak, and Odissi and assessing outcomes through Peak Expiratory Flow Rate (PEFR) and Breath Holding Time (BHT).

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MATERIALS AND METHODS

This experimental, comparative study was conducted in community and dance schools across Mumbai. The study aimed to assess the pulmonary function of 60 trained Indian classical dancers (20 participants from each group: Bharatanatyam, Kathak, and Odissi), aged between 30 to 59 years, who had at least one year of training and practiced their respective dance forms a minimum of twice weekly. Inclusion criteria required participants to be trained Indian classical dancers with at least one year of experience, aged between 30 and 59 years, and practicing their chosen dance form at least twice a week. Exclusion criteria included individuals with any pre-existing musculoskeletal, respiratory, cardiovascular, or neurological disorders, those who engaged in other forms of exercise, current smokers, or pregnant individuals. The study employed two primary tools for measurement: the Peak Flow Meter and the Breath Holding Test (BHT). Pulmonary function was assessed by measuring the Peak Expiratory Flow Rate (PEFR) using a peak flow meter. For the BHT, participants were instructed to take a deep breath, hold it for as long as possible, and the duration was recorded to assess their cardiopulmonary reserve. Prior to commencement, institutional approval and informed consent were obtained from all participants. Data collection involved administering the PEFR and BHT, after which data were analyzed using the Shapiro–Wilk test to check for normality. As the data did not follow a normal distribution, the non-parametric Kruskal–Wallis test was applied for comparisons between the three dance form groups.

RESULTS

Comparison of Peak Expiratory Flow Rate (PEFR) and Breath Holding Time (BHT) across different Indian classical dance form

DANCE FORMS	SHAPIRO WILK		MEAN RANKS	
	PEFR	BHT	PEFR	BHT
BHARATANATYAM	0.022	0.266	32.65	36.50
KATHAK	0.132	0.548	22.33	14.63
ODISSI	0.209	0.312	36.53	40.38
p-value			0.0026	0.001

Table 1. Shapiro–Wilk test of normality and mean rank values of Peak Expiratory Flow Rate (PEFR) and Breath Holding Time (BHT) across Bharatanatyam, Kathak, and Odissi dance forms.

Tests of normality were performed using the Shapiro-Wilk test for both PEFR and Breath Holding Time. The Shapiro-Wilk test showed that PEFR values were not normally distributed for Bharatanatyam ($p = 0.022$) but were normally distributed for Kathak ($p = 0.132$) and Odissi ($p = 0.209$). Because one group violated the assumption of normality, PEFR comparisons between dance forms were performed using the Kruskal-Wallis test. The mean ranks suggested that Odissi dancers had the highest PEFR values, followed by Bharatanatyam and Kathak dancers. The Kruskal–Wallis test revealed a statistically significant difference in PEFR across the three dance forms $p = 0.026 < 0.05$, the difference in PEFR across the three dance forms is statistically significant. Similarly, the Shapiro–Wilk tests indicated that BHT values were normally distributed across all groups. For Bharatanatyam, Kathak, and Odissi, the Shapiro–Wilk test yielded p-values of 0.266, 0.548, and 0.312 respectively, all exceeding the 0.05 threshold. However, Levene's test for homogeneity of variances was significant, indicating unequal variances among groups. Therefore, the non-parametric Kruskal–Wallis test was applied to compare BHT across the three dance forms. The Kruskal–Wallis test revealed a statistically significant difference ($p < 0.001$), the difference in BHT across the three dance forms is statistically significant.

DISCUSSION

This study compared pulmonary function across Bharatanatyam, Kathak, and Odissi dancers highlighting the influence of dance style on respiratory outcomes. Odissi dancers demonstrated the highest PEFR and BHT values, followed by Bharatanatyam and Kathak. These findings suggest that the sustained postures and rhythmic breathing in Odissi and Bharatanatyam may confer superior expiratory capacity and respiratory endurance compared to Kathak. Prior studies have emphasized similar benefits, with Bharatanatyam practice shown to improve respiratory efficiency [9] and structured dance training enhancing vital capacity [10]. Results are also in line with evidence from other dance forms, such as cheerleading and ballroom, where greater respiratory coordination optimizes function [11]. While previous literature has largely focused on

Bharatanatyam [9,10] this study adds new evidence by comparing multiple classical forms, highlighting that not all provide equal respiratory benefits. The consistently higher PEFR and BHT values among Odissi and Bharatanatyam dancers suggest that not all classical dance forms confer the same degree of respiratory benefits, and the variation observed in Kathak highlights the importance of breathing patterns and movement intensity in shaping pulmonary outcomes. Indian classical dance forms differ in their impact on pulmonary function, with Odissi emerging as the most beneficial in enhancing respiratory performance. These results highlight the potential of classical dance not only as an art form but also as a holistic means of promoting physical health, bridging the gap between culture, fitness, and science. Future research should adopt longitudinal approaches, include additional spirometric parameters, and standardize training frequency and duration. Such work can better establish the role of classical dance as a culturally rooted yet scientifically relevant tool for promoting pulmonary health.

CONCLUSION

The findings of this study establish that Indian classical dance is not uniform in its physiological impact on the pulmonary function and significant differences were observed across dance forms. Odissi dancers demonstrated the greatest improvements in pulmonary function, followed by Bharatanatyam, and then Kathak. These findings highlight that dance styles emphasizing rhythmic breathing and sustained postures enhance respiratory efficiency more effectively. Thus, Indian classical dance can serve not only as a cultural expression but also as a valuable tool for promoting pulmonary health in middle-aged adults.

REFERENCES

1. **Chatterjee, A. (2013).** *The therapeutic value of Indian classical, folk and innovative dance forms.* Rupkatha Journal of Interdisciplinary Studies in Humanities, 5(1), 75–83.
2. Pellegrino, R., Viegi, G., Brusasco, V., Crapo, R. O., Burgos, F., Casaburi, R., et al. (2005). Interpretative strategies for lung function tests. *European Respiratory Journal, 26*(5), 948–968.
3. Johns Hopkins Medicine. (2025). *Pulmonary function tests.* https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/pulmonary-function-tests
4. National Heart, Lung, and Blood Institute. (2025). *Pulmonary function laboratory: Tests.* https://www.nhlbi.nih.gov/science/pulmonary-function-lab/tests
5. Marieb, E. N., & Hoehn, K. (2018). *Human anatomy & physiology* (11th ed.). Pearson.
6. Cleveland Clinic. (2025). *How does blood flow through your heart?* https://my.clevelandclinic.org/health/articles/17060-how-does-the-blood-flow-through-your-heart
7. National Center for Biotechnology Information. (2025). *The circulatory system and oxygen transport.* In *Textbook of medical physiology*. NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK54112/
8. Kadel, N., & Birznieks, I. (2018). *Dance science: Anatomy, movement analysis, conditioning.* Springer.
9. Surekha, R., Archana, R., & Vijayalakshmi, B. (2018). Effect of regular dance practice on pulmonary functions and respiratory efficiency in female Bharatanatyam dancers: A pilot study. *International Journal of Research in Pharmaceutical Sciences, 9*(4), 1268–1273. https://doi.org/10.26452/ijrps.v9i4.1670

10. Sivanesan, S., Gopinath, V., & Thevanthy, T. (2014). Effect of different dance training on vital capacity among post-pubescent girls. *International Journal of Multidisciplinary Studies, 1*, 85–92. https://doi.org/10.4038/ijms.v1i1.42
11. Kolodkina, M., Radysh, I., Torshin, V., Severin, A., Korosteleva, M., Khanferyan, R., & DuBuske, L. (2023). Respiratory functions in girls with varying levels of physical activity. *Annals of Allergy, Asthma & Immunology, 131*(5, Suppl. 1).