

Effect of Pranayama and Meditation Practices on Breath Holding Time and Respiratory Rate among Women Students

Vijaya T^{1*}, M. Elango M² & Arumugam S³

¹Ph.D. Scholar (Part Time), ²Associate Professor & ³Assistant Professor

²Department of Physical Education, Health Education and Sports, The M.D.T Hindu College

^{1&3}Department of Physical Education and Sports, Manonmaniam Sundaranar University,
Tirunelveli, Tamilnadu, India - 627012

¹tsvijaya28@gmail.com, ²elangohari@rediffmail.com,

³drarul975@gmail.com

Abstract: The purpose of the study was to find out the effect of pranayama and meditation practices on breath holding time and respiratory rate among women students. To achieve the purpose of this study, twenty (n=20) college women students were randomly selected from Thenkasi District, Tamilnadu, India. The age of subjects was ranged from 18 to 23 years. The selected students were randomly divided into two groups such as Group 'I' underwent pranayama and meditation practices (n=10) for five days and one session per day and each session lasted for 60 minutes for six week period and Group 'II' acted as control group (n=10) not exposed to any specific training but they were participated in regular activities. The data on breath holding time and respiratory rate were collected and administering by nostril clip hold method (seconds) and observation of inhalation-exhalation of breathing in the chest (count/min). The pre and posttests data were collected on selected criterion variables prior to and immediately after the training programme. The pre and post-test scores were statistically examined by the dependent-'t' test and Analysis of co-variance (ANCOVA) for each and every selected variable separately. It was concluded that the pranayama and meditation practices group had shown significantly improved in breath holding time and respiratory rate. However the control group had not shown any significant improvement on any of the selected variables such as breath holding time and respiratory rate.

Keywords: Pranayama, Meditation, Breath Holding Time, Respiratory Rate, Women Students

1. Introduction

Yoga is a tradition of health and spirituality that evolved over a period of some 5000 years. The principles of yoga practice involve, the adoption and maintenance of psychophysical posture along with controlled breathing techniques it forms the basis of yoga's mind-body integration work [1].

Pranayama helps in bringing conscious awareness to breathing and the reshaping of breathing habits and patterns. Thus, a yoga practitioner, through pranayama, can at some stage control other physiological functions and finally control manifestations of prana even outside the body [2].

Meditation is a technique of extending our ordinary consciousness to reach higher states of consciousness and there by discovering more about ourselves. When we gain this insight we can change our habits and our deeper, inner personality has a better chance to show through. Our whole life changes for the better. Also meditation is often looked upon as a relaxation technique to be used for treating stress and stress related illnesses [3].

Breath holding is defined as the duration of time through which one can hold his breath without inhaling or exhaling after a deep inhalation [4].

The number of breath taken by a person in one minute is called respiration rate. It is usually measured at rest [5].

2. Methodology

2.1 Subjects

To achieve the purpose of this study, twenty (n=20) college women students were randomly selected from Thenkasi District, Tamilnadu, India. The age of subjects was ranged from 18 to 23 years.

2.2 Design of the Study

The selected participants were randomly divided into two groups such as Group 'I' underwent pranayama and meditation practices (n=10) and Group 'II' acted as control group (n=10). Group 'I' underwent pranayama with meditation practices for five days and one session per day and each session lasted for 60 minutes for six week period. Group 'II' was not exposed to any specific training but they were participated in regular activities.

2.3 Data Collection

The data on breath holding time and respiratory rate were collected and administering by nostril clip hold method (seconds) and observation of inhalation-exhalation of breathing in the chest (count/min). The pre and posttests data were collected on selected criterion variables prior to and immediately after the training programme.

2.4 Statistical Procedure

The pre and post-test scores were statistically examined by the dependent-'t' test and Analysis of co-variance (ANCOVA) for each and every selected variable separately.

3. Result and Findings

The college women students were practiced pranayama and meditation for six weeks period. Due to the effect of pranayama and meditation practices the following selected variables such breath holding time and respiratory rate were analyzed and presented below.

Table-1: Computation of 'T' - Ratio between Pre and Post-Test Means of Experimental and Control Groups on Breath Holding Time and Respiratory Rate

Criterion Variables	Test	Experimental Group	Control Group
Breath Holding Time (seconds)	Pre test	29.71	29.31
	Post test	39.25	30.37
	't'test	7.90*	1.08
Respiratory Rate (count/min)	Pre test	17.63	17.58
	Post test	15.22	17.51
	't'test	10.91*	1.43

*Significant at 0.05 level. (Table value required for significance at .05 level for 't'-test with df 9 is 2.26)

The table-1 shows that the pre-test mean value on breath holding time and respiratory rate among experimental and control groups are 29.71 & 29.31 and 17.63 & 17.58 respectively and the post-test means are 39.25 & 30.37 and 15.22 & 17.51 respectively. The obtained dependent t-ratio values between the pre and post-test means of experimental and control groups are 7.90 & 1.08 and 10.91 & 1.43 respectively. The table value required for significant difference with df 9 at 0.05 level is 2.26. Since, the obtained-'t' ratio value of experimental group was greater than the table value, it was understood that experimental group had significantly improved the breath holding time and respiratory rate. However, the control group had not improved significantly. The 'obtained t' value is less than the table value, as they were not subjected to any specific training.

Table2. Analysis of Covariance on Selected Breath Holding Time and Respiratory Rate of Experimental and Control Groups

Test	Experimental Group	Control Group	SOV	SS	Df	MS	F-ratio
Adjusted Post-Test Mean							
Breath Holding Time	39.29	30.42	B.M	718.62	1	718.62	24.04*
			W.G	508.20	17	29.89	
Respiratory Rate	15.24	17.52	B.M	80.72	1	80.72	34.64*
			W.G	39.63	17	2.33	

* Significant at 0.05 level. Table value for df 1, 17 was 4.45.

From the table-2 shows that the adjusted post-test means values experimental and control groups on breath holding time and respiratory rate are 39.29, 30.42 & 15.24, 17.52 respectively. The obtained f- ratio for variables was 24.04 and 34.64 but the required table value of df 1 and 17 was 4.45. It shows that experimental groups of obtained value were greater than the required table value at 0.05 level of confidence. This results of the study indicated that there was a significant mean difference exist between the experimental and control groups on breath holding time and respiratory rate.

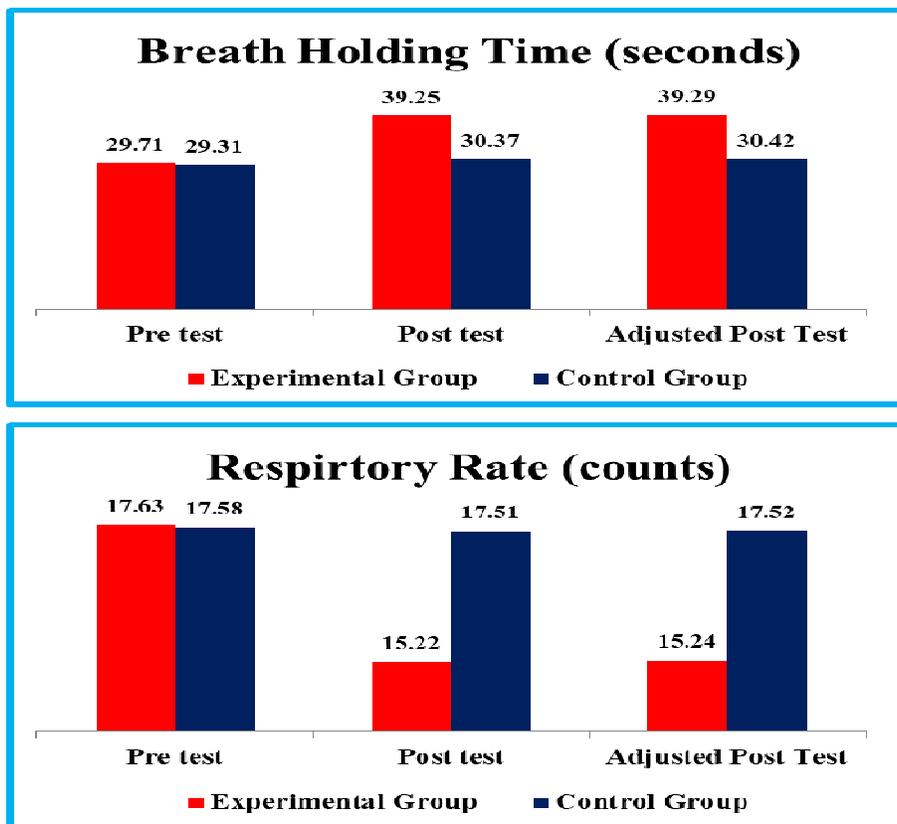


Figure 1 & 2: pre, post and adjusted post-test mean value of experimental and control groups on breath holding time and respiratory rate.

5. Discussion on Findings

The result of the study reveals that pranayama with meditation practices had brought out significant positive changes on breath holding time and respiratory rate. Regular pranayama and meditation practices increases the amount of oxygen delivered to the tissues and removal of carbon dioxide from the body. It enhances the respiratory

efficiency by increasing the strength of diaphragm and intercostal muscles, and by increasing the number of alveoli. Breath holding training is useful in athletes to improve their respiratory endurance and their performance. It increases the vital capacity and prolongs the respiratory rate. Number of times one takes inspiration or expiration in each minute. The below findings are in accordance with observations made by the following renowned experts were Gurudut, Ozha, Passanha & Patel, (2019) compared the effect of calisthenics exercises, yoga, and CPT on exercise tolerance, fatigue level, quality of life (QOL), and duration of hospital stay in COPD patients. Calisthenics, yoga, and CPT are equally effective in improving exercise tolerance, QOL, and perceived exertion. Calisthenics and yoga are equally effective and better than CPT in improving lung capacity of patients with COPD [6]. Divya, (2017) found the effect of yogic practices among school players. The yogic practices had positive impact on resting heart rate and breath holding time among school student [7]. Satish, Basavaraj, Noor, Arun, & Ramesh, (2014) conducted study on Yoga is a science practiced in India over thousands of years. 'Pranayama' is a yogic technique in which breathing is controlled voluntarily. From this study it was concluded that yogic breathing exercises like pranayama could be beneficial in better maintenance of pulmonary functions in both male and female normal healthy subjects [8]. Sekhon, & Shelvam, (2013) found the effect of selected yogic practices on vital capacity among University men students. The result of the present study has revealed that there was a significant difference among the experimental and control group on vo₂ max [9]. Kant & Mastram, (2015) conducted the effect of yoga training on physiological variables of school level students. The outcome of the study showed that twelve-week yogic practice improved the Respiratory rate of the subject [10]. Krishan, & Sharma, (2009) completed a study on effects of yogic practices and callisthenic exercises on resting pulse rate variable of secondary school boys. The result of the study suggested that resting pulse rate of yogic practices group was better than the other two groups [11]. Suriya, & Arumugam, (2018) conducted the study on influence of varied breathing exercises on vital capacity and breath holding time among kabaddi players. This study reveals that breath holding time and vital capacity was positively increased due to the influence of varied breathing exercise [12]. Arumugam, Muniyandi, & Suriya, (2018) evaluated the study on effect of aqua aerobics training on selected physiological variables among school students [13]. Vigneshwaran, (2015) studied the influence of pranayama practices on breath holding time among hockey players [14]. Selvakumar, & Vigneshwaran, (2019) conducted the study on influence of pranayama practices on resting pulse rate among kabaddi players [15]. Arumugam, S & Kumar, (2019) conducted the study on effect of game specific training on breath holding time and resting heart rate among kabaddi players [16]. Anuja, & Arumugam, (2020) conducted the study on effect of Yoga Asana with Pranayama Practices on High and Low Density Lipoprotein among Women Type-2 Diabetes Patients [17].

6. Conclusions

1. There was significant improvement on breath holding time due to the effect of pranayama with meditation practice among college women students.
2. There was significant improvement respiratory rate due to the effect of pranayama with meditation practice among college women students.
3. There was significant difference exists between experimental and control groups on breath holding time and respiratory rate due to the effect of pranayama with meditation practice among college women students.
4. However the control group had not shown any significant improvement on any of the selected variables.

References

- [1]. Vijayalakshmi, P., Madanmohan, B. A., Patil, A. S. M. I. T. A., & Babu, K. *Modulation of stress induced by isometric handgrip test in hypertensive patients following yogic relaxation training. Indian J Physiol Pharmacol*, 48(1), (2004), 59-64.

- [2]. Bijlani, R.L. *Understanding medical physiology*. 3rd Ed. New Delhi: Jaypee Brothers, (2004), p.871-910.
- [3]. Nagarathna, R., Nagendra H.R. *Yoga for promotion of positive health*. 4th ed. Bangalore: Swami Vivekananda Yoga Prakashana. (2006).
- [4]. Srivastava, R., & Sakthignanavel, D., *Effect of pilates calisthenic and combined pilates and calisthenic exercise on selected physical physiological and psychological variables of school boys (Doctoral dissertation)*. (2014), Sodhganga, Inflightnet.
- [5]. Thiess and Schnabel, *Leistungsfaktoren in training and wett Kampf* (Berlin:Sportvelag, (1987) Cited by Hardayal Singh, *Science of sports Training* (New Delhi: D.V.S. Publications, (1991):pp.115
- [6]. Gurudut, P., Ozha, S., Passanha, R., & Patel, S. *Comparative effect of chair calisthenics, Yoga, and chest physiotherapy on exercise tolerance, quality of life, and duration of hospital stay in hospitalized chronic obstructive pulmonary disease patients*. *Journal of Health Research and Reviews*, 6(2), (2019), 67.
- [7]. Divya, K. *Effect of yogic practices on selected physiological variables of school students*. *Suraj Punj Journal for Multidisciplinary Research*, 7(10), (2017), pg 411-415.
- [8]. Satish, M., Basavaraj, R., Noor, J. B., Arun, K. S., & Ramesh, K. *Gender difference in effects of short-term practice of pranayama on respiratory parameters*. *Journal of Evolution of Medical and Dental Sciences*, 3(11), (2014), 2746-2752.
- [9]. Sekhon, B. S., & Shelvam, P. V. *Effect of selected yogic practices on vital capacity among university men students*. *International Journal of Science and Research*, ISSN 2319-7064, (2013), 306-307.
- [10]. Kant & Mastram. *Effect of yoga training on physiological variables of school level students*. *International Journal of Physical Education, Sports and Health*, 2(2), (2015), pg 83-85.
- [11]. Krishan, K., & Sharma, S. K. *Effects of yogic practices and callisthenic exercises on resting pulse rate variable of secondary school boys*. *Journal of Health, Physical Education & Sports*, 1(1), (2009).
- [12]. Suriya, P., & Arumugam, S. *Influence of varied breathing exercises on vital capacity and breath holding time among kabaddi players*. *Ganesar College of Arts and Science*, (2018), 343-347.
- [13]. Arumugam, S., Muniyandi, K., & Suriya, P., *Effect of Aqua Aerobics Training on Selected Physiological Variables among School Students*. *Infokara Research*, 9 (8), (2018), Pp 157-161.
- [14]. Vigneshwaran, G. *Influence of Pranayama Practices on Breath Holding Time among Hockey Players*. *International Journal of Advance Research and Innovative Ideas in Education*, 1(4), (2015), 774-777.
- [15]. Selvakumar, & Vigneshwaran. *Influence of pranayama practices on resting pulse rate among kabaddi players*. *The International journal of analytical and experimental modal analysis*, 11 (9), (2019), Pp 3314-3317.
- [16]. Arumugam, S., & Kumar, V. V. (2019). *Effect of Game Specific Training on Breath Holding Time and Resting Heart Rate among Kabaddi Players*. *Pramana Research Journal*, 9 (2), Pp 72-75.
- [17]. Anuja, & Arumugam, S., *Effect of Yoga Asana with Pranayama Practices on High and Low Density Lipoprotein among Women Type-2 Diabetes Patients*. *Infokara Research*, 9 (8), (2020), Pp 157-161.