

Effect of Pilates Exercises, Yogic Practices and Combined Pilates Exercises and Yogic Practices on Respiratory Rate among College Female Students

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Abstract

The present study was designed to find out the effect of Pilates exercises, yogic practices and combined Pilates exercises and yogic practices on respiratory rate among college female students. For this purpose sixty(N=60) college female students studying various affiliated colleges to Thiruvalluvar University, Vellore, Tamilnadu India during the year 2019-2020 were selected randomly as subjects. The age of the subjects were ranged between 18-21 years. The subjects were assigned at random into four groups of fifteen each (n=15) namely, Pilates exercises, yogic practices, combined Pilates exercises and yogic practices and control group. Group-I underwent Pilates Exercises, Group-II underwent yogic practices, Group-III underwent combined Pilates exercises and yogic practices and Group-IV acted as control. The duration of the training period for all the three experimental groups was restricted to twelve weeks and the number of sessions per week was confined to three in a week. For combined Pilates exercises and yogic practices the training period was restricted to alternative weeks for twelve weeks. Respiratory rate was selected as dependent variable and it was assessed by manual method. All the subjects were tested prior to and immediately after the training for all the selected variables. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases. The results of the study showed that there was a significant difference was found among all the experimental groups namely Pilates exercises, yogic practices, combined Pilates exercises and yogic practices groups had significantly increase in respiratory rate. Further the results of the study showed that combined Pilate's exercises and yogic practices group was found to be better than the Pilate's exercises group and yogic practices group in respiratory rate.

Keywords: Pilates Exercises, Yogic Practices, Combined Pilates Exercises and Yogic Practices, Respiratory Rate

1. Introduction

The Pilates method is a concept of body and mind exercises founded by Joseph H Pilates in the early 1900s. [1] In the development of his own method Pilates drew inspiration from yoga, martial arts, Zen meditation, ballet, as well as ancient Greek and Roman exercises. [3]

Pilates exercises comprises of physical and mental training, which focuses on body perception thereby linking the body and mind. [3] It mainly works on six essential and interconnected principles: centering, concentration, control, precision, breathing and movement flow. [4] These days Pilates has gained recognition in both rehabilitation and fitness programs [5] and are being extensively used for the physical conditioning and, for rehabilitation and prevention and are thus found to be associated with wellness. [6]

Yoga originated in ancient India, and denotes the union between the individual self and the transcendental self. Yoga practice mainly consists of Asana (Posture- a particular position of the body which contributes to steadiness of body and mind), Pranayama (to control the breathing in a superior and extra-ordinary way to get maximum benefits.) and Meditation. There are several facts supporting the physiological changes that can occur following yoga therapy. [7]

The most important benefit of yoga is physical and mental therapy. Indians have given great importance to „yoga“ and „physical exercises“ not only to prevent or cure the physical ailments/diseases but to keep fit also. The great ancient Rishis, Vedas and Purans also have given much importance to physical fitness. Yoga asana has several exercises or postures that work wonders on fitness and health. Varying widely in application and style, these exercises (postures) gently stretch and explore all parts of body. Yoga asana boost physical strength, stamina and flexibility, improve blood circulation, enhance posture and muscle tone and bestow greater powers of concentration and self-control. Through the practice of yoga, we become aware of the connection between our emotional, mental and physical levels On the other hand pranayama is one of the five principles of Yoga or breathing and exercise which promote proper breathing [8]

A number of clinical trials have suggested that yoga training may improve the pulmonary function of patients with Chronic obstructive pulmonary disease [9-10]but the quality of these studies have not been evaluated systematically. Therefore, we undertook a comparison of pilates exercises and yoga practices for respiratory rate variation.

2. Methodology

The study was conducted on sixty(N=60) college female students studying various affiliated colleges to Thiruvalluvar University, Vellore, Tamilnadu India during the year 2019-2020 were selected randomly as subjects. The age of the subjects were ranged between 18-21 years. The subjects were assigned at random into four groups of fifteen each (n=15) namely, Pilates exercises, yogic practices, combined Pilates exercises and yogic practices and control group. Group-I underwent Pilates Exercises, Group-II underwent yogic practices, Group-III underwent combined Pilates exercises and yogic practices and Group-IV acted as control. The duration of the training period for all the three experimental groups was restricted to twelve weeks and the number of sessions per week was confined to three in a week. For combined Pilates exercises and yogic practices the training period was restricted to alternative weeks for twelve weeks. Respiratory rate was selected as dependent variable and it was assessed by manual method. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases.

3. Results and Discussions

The analysis of dependent 't'-test on the data obtained respiratory rate of the subjects in the Pre-test and Post-test of experimental groups and control group have been presented in table-1.

Table – 1
Summary of Mean and Dependent 't' Test for the Pre and Post Tests on Respiratory Rate of Experimental Groups and Control Group (Measures in Counts per minute)

Mean	Pilates Exercises Group	Yogic Practices Group	Combined Pilates Exercises and Yogic Practices Group	Control Group
Pre- test mean	19.73	19.87	19.27	18.67
Post-test mean	17.20	17.33	16.40	18.87
't'-test	2.60*	2.65*	3.94*	0.19

* Significant at 0.05 level.

(Table value required for significance at .05 level for 't'-test with df 14 is 2.15)

Table -1 shows that the pre-test mean on respiratory rate for Pilate's exercises group, yogic practices group, combined Pilate's exercises and yogic practices group and control group are 19.73, 19.87, 19.27 and 18.67 respectively. The post-test mean are 17.20, 17.33, 16.40 and 18.87 respectively. The obtained dependent t-ratio values between the pre and post test means on respiratory rate for Pilate's exercises group, yogic practices group, combined Pilate's exercises and yogic practices group and control group are 2.60, 2.65, 3.94 and 0.19 respectively.

The table value required for significant difference with df 14 at 0.05 level is 2.15. It was concluded that experimental groups such as respiratory rate for Pilate's exercises group, yogic practices group and combined Pilate's exercises and yogic practices group had registered significant improvement in respiratory rate.

The results of the Analysis of Covariance on respiratory rate of the pre, post, and adjusted test scores of Pilate's exercises group, yogic practices group, combined Pilate's exercises and yogic practices group and Control group are presented in table -2.

Table – 2
Values of Analysis of Covariance for Experimental Groups and Control Group on Respiratory Rate (Measures in Counts per minute)

Test	Pilates Exercises Group	Yogic Practices Group	Combined Pilates Exercises and Yogic Practices Group	Control Group	SV	SS	df	MS	F-ratio
Pre-Test Mean	19.73	19.87	19.27	18.67	BG	13.25	3	4.42	2.19
					WG	112.93	56	2.02	
Post-Test Mean	17.20	17.33	16.40	18.87	BG	47.78	3	15.93	6.92*
					WG	47.78	56	2.30	
Adjusted Post-Test Mean	19.95	16.99	16.48	19.38	BS	71.61	3	23.87	18.21*
					WS	72.11	55	1.31	

SV- Source of Variance, SS- Sum of Squares, df- degree of freedom, MS-Mean Squares, BG- Between Groups, WG-Within Groups, BS- Between Sets, WS-within Sets, * Significant at 0.05 level of confidence, Table value for df (3, 56) at 0.05 level = 2.76, Table value for df(3,55) at 0.05 level = 2.78

The table-1 shows that the obtained 'F' ratio of 2.19 for the pre test mean is lesser than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on respiratory rate. The obtained 'F' ratio of 6.92 for the post test mean is greater than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on respiratory rate.

The adjusted post test mean values of respiratory rate for Pilate's exercises group, yogic practices group, combined Pilate's exercises and yogic practices group and control group is 19.95, 16.99, 16.48 and 19.38 respectively. The obtained 'F' ratio of 18.21 for the adjusted post test mean is greater than the table value of 2.78 for degrees of freedom 3 and 55 required for significance at 0.05 level of confidence on respiratory rate.

The analysis of the study indicated that there was a significant difference between the adjusted post-test means of Pilate's exercises group, yogic practices group, combined Pilate's exercises and yogic practices group and control group on respiratory rate.

Pair wise comparisons of Scheffe's Post Hoc test results are presented in table – 3.

Table - 3

The Scheffe's test for the differences between the adjusted post tests paired means on Respiratory Rate (Measures in Counts per minute)

Certain Variables	Adjusted Post test Means				Mean Difference	Confidence Interval
	Pilates Exercises Group	Yogic Practices Group	Combined Pilates Exercises and Yogic Practices Group	Control Group		
Respiratory Rate	16.95	16.99			0.04	1.21
	16.95		16.48		0.47	1.21
	16.95			19.38	2.42*	1.21
		16.99	16.48		0.51	1.21
		16.99		19.38	2.39*	1.21
			16.48	19.38	2.89*	1.21

* Significant at.05 level of confidence

Table-2 shows that the adjusted post test mean differences on respiratory rate between Pilate's exercises group and control group, yogic practices group and control group, combined Pilate's exercises and yogic practices group and control group are 2.42, 2.39 and 2.89 respectively and they are greater than the confidence interval value 1.21, which shows significant differences at 0.05 level of confidence.

Further the table-2 shows that the adjusted post test mean differences on respiratory rate between Pilate's exercises group and yogic practices group, Pilate's exercises group and combined Pilate's exercises and yogic practices group, yogic practices group and combined Pilate's exercises and yogic practices group are 0.04, 0.47 and 0.51 respectively and they are lesserr than the confidence interval value 1.21, which shows no significant differences at 0.05 level of confidence.

The results of the study further have revealed that there is a significant difference in respiratory rate between the adjusted post test means of Pilate's exercises group and control group, yogic practices group and control group, combined Pilate's exercises and yogic practices group and control group. Further the results of the study revealed that there is no significant difference in respiratory rate between Pilate's exercises group and yogic practices group, Pilate's exercises group and combined Pilate's exercises and yogic practices group, yogic practices group and combined Pilate's exercises and yogic practices group.

However, the decrease in respiratory rate was significantly higher for combined Pilate's exercises and yogic practices group than other experimental groups.

It may be concluded that the combined Pilate's exercises and yogic practices group has exhibited better than the other experimental groups in decreasing respiratory rate.

The pre, post and adjusted post test mean value of experimental groups on respiratory rate is graphically represented in the Figure -1.

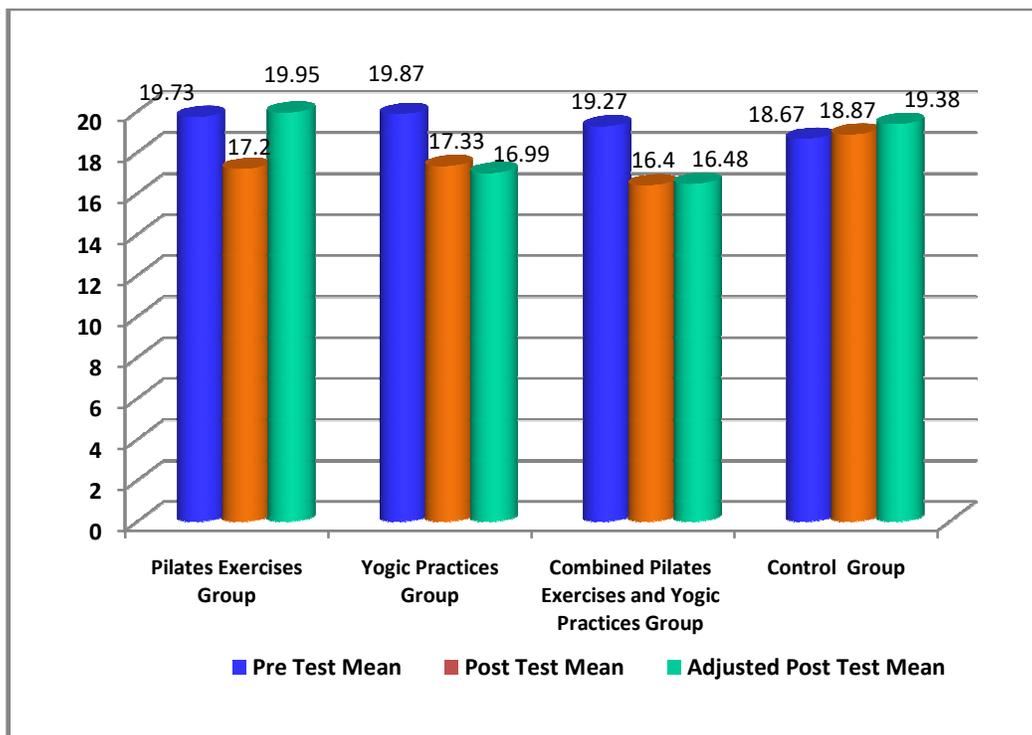


Fig-1: Bar diagram on ordered adjusted means of Respiratory rate (Measures in Counts per minute)

4. Conclusions

Significant differences in achievement were found between Pilate's exercises group, yogic practices group, combined Pilate's exercises and yogic practices group and control group in the selected criterion variable such as respiratory rate. The experimental groups namely, Pilate's exercises group, yogic practices group, combined Pilate's exercises and yogic practices group and control group had significantly decreased in respiratory rate.

The combined Pilate's exercises and yogic practices group was found to be better than the Pilate's exercises group, yogic practices group and control group in decreasing respiratory rate.

5. References

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