EFFECT OF SLOW SURYANAMASKAR PRACTICES ON BREATH HOLDING TIME AND RESPIRATORY RATE AMONG SCHOOL GIRLS

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Abstract
The purpose of the study was to find out the effect of slow suryanamaskar practices on breath holding time and respiratory rate among school girls. To achieve the purpose of this study, 30 school girls were randomly selected as subjects from the Kendriya Vidyalaya School, Meenambakkam Chennai, Tamilnadu, India. Their age were ranged from 12 to 15 years. The selected subjects were randomly divided into two groups such as group 'I' underwent slow suryanamaskar practices (n=15) and group 'II' acted as control group (n=15). Group 'I' underwent slow suryanamaskar practices for six days in a week and one session per day and each session lasted for 35 minutes for six week. Group 'II' was not exposed to any specific training but they were participated in regular activities. The data on breath holding time was measured by Nostril clip method (seconds) and respiratory rate was measure by manual method (counts). The pre and post tests 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 slow suryanamaskar practices group had shown significantly improved in breath holding time and respiratory rate among school girls. However the control group had not shown any significant improvement on any of the selected variables such as breath holding time and respiratory rate.

Index Terms: Slow Suryanamaskar Practices, Breath Holding Time, Respiratory Rate, School Girls

I. INTRODUCTION

Suryanamaskar is a sequential combination of yogic postures performed dynamically in synchrony with the breath. Although there are a number of reports on the effect of yoga training on pulmonary functions respiratory pressures handgrip strength and endurance and cardiovascular parameters scientific literature is deficient on the physiological effects of SN that is an integral part of modern yoga training [1].

Suryanamaskar or sun salutation is a traditional Indian yogic practice, renders the benefits of stretching, static, and dynamic exercise. Each round of Suryanamaskar practice involves practicing 12 postures in succession with forward and backward bending along with deep exhalation and inhalation respectively to the maximum possible extent. Many people practice several rounds of Suryanamaskar for their regular physical fitness program [2].

Suryanamaskar is a well know and vital technique with the yogic repertoire. It is versatility and application make it one of the most useful methods to induce a healthy, vigorous, active life and at the same time prepare for spiritual awakening and the resultant of awareness [3].

Breath holding time is the time taken by the subject to hold his breath as long as he can. During voluntary breath holding, tissues continue to utilize oxygen and liberate carbon dioxide. Therefore during breath holding arterial pO2 falls and pCO2 rises. Since both these factors are powerful respiratory stimulants, a point is reached where the respiratory drive becomes so strong that the person cannot hold the breath any longer [4]

Apart from physical health and physiological rest, an improved attention process and cognitive function determines the scholastic performance in school children. While the above studies have looked at Surya namaskar as an effective physical activity and earlier studies have suggested that physical exercise can improve executive functions in school children [5].

While doing suryanamaskara, the lungs exhale and inhale in specific periodic manner results improved contractility of respiratory tree and increased vital capacity leading to the more stable, revitalized, oxygenated lungs and whole body too. It balances the whole endocrinial system by direct massaging of glands and by increase blood flow [6].
II. PURPOSE OF THE STUDY

The purpose of the study was to find out the effect of slow suryanamaskar practices on breath holding time and respiratory rate among school girls.

III. METHODOLOGY

To achieve the purpose of this study, 30 school girls were randomly selected as subjects from the Kendriya Vidyalaya School, Meenambakkam Chennai, Tamilnadu, India. Their age were ranged from 12 to 15 years. The selected subjects were randomly divided into two groups such as group ‘I’ underwent slow suryanamaskar practices (n=15) and group ‘II’ acted as control group (n=15). Group ‘I’ underwent slow suryanamaskar practices for six days in a week and one session per day and each session lasted for 35 minutes for six week. Group ‘II’ was not exposed to any specific training but they were participated in regular activities. The data on breath holding time was measured by Nostril clip method (seconds) and respiratory rate was measure by manual method (counts). The pre and post tests 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.

VI. ANALYSIS OF THE DATA

The effect of slow suryanamaskar practices on breath holding time were analyzed and presented below.

4.1 Breath Holding Time

<table>
<thead>
<tr>
<th>Criterion variables</th>
<th>Mean Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breath Holding Time</td>
<td>Pre test 18.12</td>
<td>18.18</td>
</tr>
<tr>
<td></td>
<td>Post test 26.15</td>
<td>18.53</td>
</tr>
<tr>
<td>‘t’ test</td>
<td>6.12</td>
<td>0.46</td>
</tr>
</tbody>
</table>

*Significant at .05 level. (Table value required for significance at .05 level for ‘t’-test with df 14 is 2.145)

The table 4.1 shows that the pre-test mean value of experimental group and control group on breath holding time are 18.12 and 18.18 respectively and the posttest means are 26.15 and 18.53 respectively. The obtained dependent t-ratio values between the pre- and posttest means of slow suryanamaskar practices and control group are 6.12 and 0.46 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.145. From the above table the dependent ‘t’-test values of on breath holding time between the pre and post tests means of experimental groups were greater than the table value 2.145 with df 14 at 0.05 level of confidence, it is concluded that experimental group had significant improvement in the on breath holding time compared to control group.

4.2 Computation of Analysis of Covariance

The descriptive measures and the results of analysis of covariance on the criterion measures were given in the following tables.

Table 4.2 shows that the adjusted post test means values on breath holding time of experimental and control groups 26.53 and 18.53 respectively. The obtained f-ratio of 59.26 for adjusted post test mean is greater than the table value 4.21 with df 1 and 27 required for significance at 0.05 level of confidence. The results of the study indicates that there was a significant mean difference exist between the adjusted post test means of slow suryanamaskar practices and control groups on breath holding time. The bar diagram shows the mean values of pretest, post test and adjusted post test on breath holding time of slow suryanamaskar practices and control group.
4.3 Respiratory Rate

Table 4.3
Means and dependent 't' - test for the pre and post tests on respiratory rate experimental and control groups (seconds)

<table>
<thead>
<tr>
<th>Criterion variables</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Rate Pre test</td>
<td>27.15</td>
<td>27.89</td>
</tr>
<tr>
<td>Respiratory Rate Post test</td>
<td>24.43</td>
<td>26.61</td>
</tr>
<tr>
<td>'t'test</td>
<td>12.18</td>
<td>1.19</td>
</tr>
</tbody>
</table>

*Significant at .05 level. (Table value required for significance at .05 level for ‘t’-test with df 14 is 2.145)

The table 4.3 shows that the pre-test mean value of experimental group and control group on respiratory rate are 27.15 and 27.89 respectively and the posttest means are 24.43 and 26.61 respectively. The obtained dependent t-ratio values between the pre-and posttest means of slow suryanamaskar practices and control group are 12.18 and 1.19 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.145. From the above table the dependent ‘t’-test values of on respiratory rate between the pre and post tests means of experimental groups were greater than the table value 2.145 with df 14 at 0.05 level of confidence, it is concluded that experimental group had significant improvement in the on respiratory rate compared to control group.

4.2 Computation of Analysis of Covariance

The descriptive measures and the results of analysis of covariance on the criterion measures were given in the following tables.

Table 4.4
Computation of mean and analysis of covariance on respiratory rate of experimental and control groups

<table>
<thead>
<tr>
<th>Respiratory Rate</th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24.31</td>
<td>26.57</td>
<td>BG</td>
<td>36.54</td>
<td>1</td>
<td>36.54</td>
<td>73.08*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WG</td>
<td>13.47</td>
<td>27</td>
<td>0.50</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 0.05 level. Table value for df 1, 27 was 4.21

Table 4.4 shows that the adjusted post test means values on respiratory rate of experimental and control groups 24.31 and 26.57 respectively. The obtained f- ratio of 73.08 for adjusted post test mean is greater than the table value 4.21 with df 1 and 27 required for significance at 0.05 level of confidence. The results of the study indicates that there was a significant mean difference exist between the adjusted post test means of slow suryanamaskar practices and control groups on respiratory rate. The bar diagram shows the mean values of pretest, post test and adjusted post test on respiratory rate of slow suryanamaskar practices and control group.
V. DISCUSSION ON FINDINGS

Amit Vaibhav., Swati Shukla & Om Prakash Singh (2016) contacted a study on Surya Namaskar (Sun Salutation): A Path to Good Health. Its concluded on his study Surya Namaskar steps are very scientific and practical science ancient time but still it needs advance modern scientific justification to spread it globally, keeping this thing into the mind the present review has been framed to revalidate sacred steps of Surya Namaskar on the basis of available evidence based studies. Vivek Singh (2014) to discussed on his study on Effect of suryanamaskar on vital capacity of school girls: a mixed design approach. Finally his told that Suryanamaskar practice for 6 weeks with pace 1 help to improve better vital capacity as compare pace 1, pace 4 and control group. The beneficial effects of Suryanamaskar practices (with pace 1) is as similar as aerobic workout. It can be applied to all schools to improve the physical health and sports activities of the students. Arumugam, S. & Anuja, P. (2016) they attempted the study on impact of yoga breathing exercises on total lung capacity among women soccer players. They conclude his study yoga breathing exercises can improved on total lung capacity among women soccer player

VI. CONCLUSIONS

- It was concluded that the slow suryanamaskar practices group had shown significantly improved on breath holding time
- It was concluded that the slow suryanamaskar practices group had shown significantly improved on respiratory rate.
- However the control group had not shown any significant improvement on any of the selected variable such as breath holding time and respiratory rate.

VII. REFERENCE: