EFFECT OF YOGIC EXERCISE AND PHYSICAL EXERCISE ON PHYSICAL
HEALTH AND MENTAL HEALTH.

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ABSTRACT: The present study includes two independent groups of subjects. Sixty healthy
collected were randomly assigned and were assigned two groups of 30 subjects each. They were in
the age range of 30-45 years. First group was the Yoga group which consisted of 17 males and 13
females. The second group was the physical exercise group which consisted of 20 males and 10
females. After these subjects were randomly assigned to these two groups, Yoga group joined on
three months yoga training course at Yoga Sikhsanstan. They attended yoga classes regularly
and practiced yoga under guidance of qualified yoga teachers. The subjects in the physical exercise
group started practicing brisk walk regularly in the morning hours. Initially base line recordings of
four physiological parameters mainly systolic blood pressure, diastolic blood pressure, pulse rate,
body weight were recorded individually for all the subjects in both Yoga group and physical
exercise group. Later their mental health assessment was made by administering general health
questionnaire. In conclusion it may be said that since both physical exercise group and yoga
training group comprised of very healthy subjects, the impact of training is not glaring, including a
control group and a clinical group such as obese or hypertension would certainly bring about subtle
differences in the two systems. Regarding the psychological variables both yoga and physical
exercise group showed significant change except in the case of somatic symptoms. In addition to
these variables of assessment of subjective well being is also made on both the group before and
after training, would give us an opportunity to compare the merits of these two systems.

KEY WORDS: Yoga, Exercise, Physical health, Mental health.

INTRODUCTION: Yoga provides one of the best means of self-improvement and attaining one's full
potential. It is generally held that the advanced stages of yoga, super conscious states are attained
which result in a feeling of bliss, deep peace and the emergence of psychic powers. Yoga was
developed and perfected over the centuries by philosophers and mystics in India. It is basically a
method by which we increase the body's supply of energy and remove any interference to the
transmission of energy throughout the body. Yoga has specialized in this subject for thousands of
years and stream lined the methods to attain this aim. Along with meditation, it is probably one of
the most popular alternative therapies today in India. Many physicians, who are skeptical about the
efficacy of alternative medicine, show a tendency to support yoga with a passion in recent years.
The best part of it is that it is something that can be done in the comfort of our home. Various Yogic
practices such as body postures, breath regulation, cleansing procedures, and meditation will go a
long way towards better health and relaxation.

Physical exercise is the state of being active with action or movement. Physical activity can
increase the basal metabolic rate by approximately 10%. This increase can last for up to 48 hrs after
the completion of the activity. It helps burn calories. The number of calories used is dependent on
the type and intensity of activity, and on the body weight of the person performing the physical
activity. It also helps in the maintenance and control of weight.

According to the American college of sport medicine physical activity of less than two times
a week at less than 60% of the maximum heart rate, for less than 10 minutes per day, does not
assist in developing and maintaining fitness. If physical activity is discontinued, the fitness benefits
are completely lost, and the person has to restart again. 20 minutes of continuous aerobic activity
three days per week is recommended for weight loss. Examples of physical activity that are
considered aerobic are walking, running, jogging, swimming, bike riding, rowing, jumping rope, etc.

METHODS AND MATERIALS:
SUBJECTS: The investigation was carried out on two independent groups of subjects. Sixty healthy
volunteers were randomly selected and were assigned two groups of 30 subjects each. They were in
the age range of 30-45 years. First group was the Yoga group which consisted of 17 males and 13
females. The second group was the physical exercise group which consisted of 20 males and 10
females. After these subjects were randomly assigned to these two groups Yoga group joined on
three months yoga training course at Yoga Siksha Sansthan, Steel Plant, Visakhapatnam. They
attended yoga classes regularly and practiced yoga under guidance of qualified yoga teachers. The
subjects in the physical exercise group started practicing brisk walk regularly in the morning hours.

TOOLS USED
In the present study the following physiological and psychological tools were employed.
1. Sphygmomanometer – blood pressure was recorded. For all the subjects using Sphygmo
manometer. It was recorded with the subjects in the supine position.
2. Weighing Machine: Body weight of all the subjects was recorded using the standard
weighing machine.
3. The pulse rate was recorded for all the subjects. The rate of radial artery pulsations was
recorded by palpatory method.
4. General health questionnaire. In the present study mental health assessment of all the
subjects in both the groups was made using the general health questionnaire developed by
D.P. Goldberg and V.F. Hillier (Dept. of Psychiatry, University of Manchester).

PROCEDURE: Initially base line recordings of four physiological parameters mainly systolic blood
pressure, diastolic blood pressure, pulse rate, body weight were recorded individually for all the
subjects in both Yoga group and physical exercise group. Later their mental health assessment was
made by administering general health questionnaire. The questionnaire was administered in a quite atmosphere in small groups. Very clear instructions regarding the questionnaire were given. It was made sure that every subject understood the procedure. They are asked to give spontaneous responses to each item of the questionnaire. After taking the baseline reading of all the parameters, Yoga group started practicing Yoga for two hours every day for duration of three months. The physical exercise group started brisk walk every day for one hour. They continued their practice for three months. At the end of three months both the subjects in yoga group and the subjects in the physical exercise group were assessed for the same physiological and psychological parameters again.

RESULTS AND DISCUSSION:

Table – 1
Sample Characteristics

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Physical Group</th>
<th>Exercise Group</th>
<th>Yoga Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No. of Subjects</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>Male</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>3.</td>
<td>Female</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>4.</td>
<td>Age</td>
<td>30-45 Years</td>
<td>30-45 Years</td>
</tr>
</tbody>
</table>

Table – 1 shows the sample characteristics. 30 subjects were assigned in each group they were in the age range of 30-45 years. First group was the physical exercise group consisting of 20 males and 10 females. The second group was the yoga group consisting of 17 males and 13 females.

Table 2: Showing pretest and post test physiological variables for the Yoga Group

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable</th>
<th>Mean±SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Systolic BP</td>
<td>115.83±10.26</td>
<td>9.279</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Diastolic BP</td>
<td>77.83±9.89</td>
<td>6.922</td>
<td>0.000</td>
</tr>
<tr>
<td>3.</td>
<td>Pulse rate</td>
<td>68.63±5.84</td>
<td>7.101</td>
<td>0.000</td>
</tr>
<tr>
<td>4.</td>
<td>Weight</td>
<td>65.87±8.67</td>
<td>6.707</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable</th>
<th>Mean±SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Systolic BP</td>
<td>116.50±6.58</td>
<td>9.279</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Diastolic BP</td>
<td>77.83±6.39</td>
<td>6.922</td>
<td>0.000</td>
</tr>
<tr>
<td>3.</td>
<td>Pulse rate</td>
<td>67.57±4.20</td>
<td>7.101</td>
<td>0.000</td>
</tr>
<tr>
<td>4.</td>
<td>Weight</td>
<td>64.00±8.18</td>
<td>6.707</td>
<td>0.000</td>
</tr>
</tbody>
</table>
The data obtained on yoga practitioners for all the physiological parameters before and after training in yoga are presented in Table – 2. The data was analysed to find out whether there is any significant difference in the scores obtained before and after yoga training, in other words the impact of Hatha Yoga Practice on physiological parameters. In the pre-training testing, the mean score of systolic blood pressure was 115.83 and when tested after three months of yoga the systolic blood pressure was 116.50. The difference between the means yielded a t-ratio of 0.548 which was statistically not significant. The mean diastolic blood pressure of the group before yoga training was 77.83 and it was tested after training also, it was 77.83 which shows that there was no difference in the mean diastolic blood pressure measured before and after yoga training. Before yoga training the group recorded the mean pulse rate of 68.63 and it was 67.57 after yoga training. The difference between both means and yielded a t ratio of 0.908 which was statistically not significant. The mean body weight of the group was 65.87 before yoga training and after training it was 64.00. The mean difference between the two scores gave a t ratio 6.100 which was significant at 0.00 level. Of all the four physiological variables that were measured, body weight reduced significantly after Yoga training whereas the remaining variables namely systolic BP, Diastolic BP, pulse rate did not show any significant change.

Table – 3 Showing pretest and post test physiological variables for the Yoga Group

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable</th>
<th>Mean±SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Somatic symptoms</td>
<td>6.90 ± 3.62</td>
<td>9.279</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Anxiety and insomnia</td>
<td>6.33 ± 4.05</td>
<td>6.922</td>
<td>0.000</td>
</tr>
<tr>
<td>3.</td>
<td>Social dysfunction</td>
<td>6.27 ± 4.27</td>
<td>7.101</td>
<td>0.000</td>
</tr>
<tr>
<td>4.</td>
<td>Severe depression</td>
<td>5.93 ± 4.60</td>
<td>6.707</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable</th>
<th>Mean±SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Somatic symptoms</td>
<td>2.10 ± 2.06</td>
<td>9.279</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Anxiety and insomnia</td>
<td>1.50 ± 1.61</td>
<td>6.922</td>
<td>0.000</td>
</tr>
<tr>
<td>3.</td>
<td>Social dysfunction</td>
<td>1.90 ± 2.29</td>
<td>7.101</td>
<td>0.000</td>
</tr>
<tr>
<td>4.</td>
<td>Severe depression</td>
<td>2.10 ± 2.92</td>
<td>6.707</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The data obtained from yoga practitioners on the physiological variables before and after training are presented in Table – 3. The mean scores obtained before yoga training on somatic symptoms was 6.90 and after 3 months of training it was 2.10. The mean difference gave a t ratio of 9.279 which was highly significant at 0.01 level. On anxiety and insomnia variable, the group obtained a mean score of 6.33 before training and the score was 1.50 after training. The mean difference yielded a t ratio 6.922 which was significant at 0.01 level.
On the variable social dysfunction the group obtained a mean score of 6.27 before training and 1.90 after training. The mean difference between the two scores obtained on two occasions was significant at 0.01 level with a \( t \) ratio of 6.707. The data obtained on psychological variables for yoga training group on the two occasions once before and again after 3 months of yoga training reveals that there is a significant difference between the scores.

Table – 4 showing pretest and post test physiological variables for the Physical Exercise Group

<table>
<thead>
<tr>
<th>Pre Test</th>
<th>S. No.</th>
<th>Variable</th>
<th>Mean±SD</th>
<th>( t )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Systolic BP</td>
<td>116.50 ± 7.67</td>
<td>9.279</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Diastolic BP</td>
<td>76.50 ± 8.42</td>
<td>6.922</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Pulse rate</td>
<td>69.73 ± 3.06</td>
<td>7.101</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Weight</td>
<td>66.57 ± 8.21</td>
<td>6.707</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post Test</th>
<th>S. No.</th>
<th>Variable</th>
<th>Mean±SD</th>
<th>( t )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Systolic BP</td>
<td>115.50 ± 6.48</td>
<td>9.279</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Diastolic BP</td>
<td>74.50 ± 7.58</td>
<td>6.922</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Pulse rate</td>
<td>68.43 ± 2.74</td>
<td>7.101</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Weight</td>
<td>65.40 ± 7.64</td>
<td>6.707</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Table – 4 shows the mean scores of physical exercise group on all the physiological parameters measured before and after 3 months of regular brisk walk practice in the morning. The data was analysed to find out whether there is any significant difference in the physiological parameters measured before and after 3 months of brisk walk.

Before the group was introduced to physical exercise, the mean score for systolic blood pressure was 115.50, difference between the two means yielded a \( t \) ratio of 1.099 which was not statistically significant. The group maintained mean diastolic pressure of 76.50 and 74.50 before and after 3 months brisk walk practice. The difference between the means was significant at 0.01 level with a \( t \) ratio of 2.693 the mean pulse rate of the group was 69.73 and 68.43 before and after yoga training respectively. The difference between the means gave a \( t \) ratio of 2.973 which was significant at 0.006.

The mean body weight of the group was 66.57 and 65.40 before and after training in physical exercise. The mean difference was found to be significant at 0.01 level with a \( t \) ratio of 5.299.

Thus the results of the physical exercise group reveal that there is a statistically significant difference on diastolic blood pressure, pulse rate and body weight assessed before and after 3 months of regular brisk walk.
Table – 5 Showing pretest and post test physiological variables for the physical exercise Group

Pre Test

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable</th>
<th>Mean±SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Somatic symptoms</td>
<td>3.92± 2.68</td>
<td>9.279</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Anxiety and insomnia</td>
<td>5.27± 3.86</td>
<td>6.922</td>
<td>0.000</td>
</tr>
<tr>
<td>3.</td>
<td>Social dysfunction</td>
<td>6.67± 3.27</td>
<td>7.101</td>
<td>0.000</td>
</tr>
<tr>
<td>4.</td>
<td>Severe depression</td>
<td>2.63± 2.39</td>
<td>6.707</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Post Test

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable</th>
<th>Mean±SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Somatic symptoms</td>
<td>3.83± 2.61</td>
<td>9.279</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Anxiety and insomnia</td>
<td>4.60± 3.65</td>
<td>6.922</td>
<td>0.000</td>
</tr>
<tr>
<td>3.</td>
<td>Social dysfunction</td>
<td>5.43± 3.16</td>
<td>7.101</td>
<td>0.000</td>
</tr>
<tr>
<td>4.</td>
<td>Severe depression</td>
<td>1.70± 2.25</td>
<td>6.707</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The data of the physical exercise group on the physiological variables that was obtained and after training are presented in Table – 5. Before the group was introduced to physical exercise it obtained a mean score of 3.93 on somatic symptoms and it was 3.83 after training. The mean difference was statistically not significant. On anxiety and insomnia variable the group obtained a mean score of 5.27 and 4.60 before and after training respectively. The mean difference was significant at 0.01 level. On social dysfunction the mean score was 6.67 before training and it was 3.16 after training. The difference between means was significant at 0.01 level with a $t$ ratio of 5.798. On severe depression variable pre training score of the group was 2.63 and at post training it was 1.70, the mean difference yielded $t$ ratio of 5.635 which was significant at 0.01 level.

The data of physical exercise group on psychological variables shows that the group’s performance on anxiety and insomnia, social dysfunctions and severe depression differed significantly after 3 months of regular brisk walk.

Examining the results presented in the above tables, it appears that on physiological variables, physical exercise caused significant change in diastolic blood pressure, pulse rate and body weight whereas yoga training caused significant change only in body weight. Initial examination suggests that physical exercise had broader impact on physiological variables than yoga training. However, closer look at the data suggests that the mean scores on all the physiological variables were within the normal range both before and after training. The participants were enjoying good health even before they started yoga or physical exercise. Even after training their health status continued in the normal limits. At this stage it may be said that whatever may be the training given, it cannot be expected to reduce the scores below the normal limit ant it is not desirable too.

Hence, it may be said that the selected sample enjoys good health as far as the physiological measures that are studied are concerned. Even after training they continued the same status. In the case of physical exercise group. The mean difference was slightly more.
An examination of the impact of physical exercise and yoga training on psychological variables suggest that in the yoga training group there was significant change in all the four variables, namely somatic symptoms, anxiety, insomnia, social dysfunction and severe depression. Similarly in the physical exercise group the difference was statistically significant in all variables except somatic symptoms. From the results it appears that both physical exercise and yoga training are effective in improving psychological health of its practitioners.

A closer examination reveals that although yoga training and physical exercise contributed to bring about significant change in psychological variables, the magnitude of the change appears to be more in the case of yoga training. This may be noticed in the mean scores presented in Table – 3 and Table – 5. However, it cannot be concluded that yoga training is better than physical exercise.

**CONCLUSION:** In conclusion it may be said that since both physical exercise group and yoga training group comprised of very healthy subjects, the impact of training is not glaring, including a control group and a clinical group such as obese or hypertension would certainly bring about subtle differences in the two systems. Regarding the psychological variables both yoga and physical exercise group showed significant change except in the case of somatic symptoms. In addition to these variables of assessment of subjective well being is also made on both the group before and after training, would give us an opportunity to compare the merits of these two systems.

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