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Effects of Suryanamaskar practice with rhythmic training on selected health related physical fitness components and psychological variables among school girls

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Abstract

The purpose of the study was to find out the effects of Suryanamaskar practice with rhythmic training on selected health related physical fitness components and psychological variables school girls. To achieve the purpose of the study, forty school girls were selected randomly 12 to 14 years of age from Marudhamalai swamy Devasthanam higher secondary school, Vadavalli, Coimbatore. The selected subjects were divided into two equal groups namely experimental and control groups of 20 subjects each. The training period was limited to twelve weeks and for six days per week. The suryanamaskar practice with rhythmic training was selected as independent variables and Body Mass Index (BMI), Flexibility, Muscular Strength and Endurance, Cardio Respiratory Endurance, Stress and Anxiety were selected as dependent variables and it was measured by Body Mass Index, Sit and Reach, Modified Sit – ups, Twelve Minutes Cooper's Run / Walk test, Questionnaire respectively. All the subjects were tested two days before and immediately after the experimental period on the selected dependent variables. The obtained data from the experimental group and control group before and after the experimental period were statistically analyzed with dependent 't'-test to find out significant improvements. The level of significance was fixed at 0.05 level confidences for all the cases. Significant improvement was found on Body Mass Index (BMI), Flexibility, Muscular Strength and Endurance, Cardio Respiratory Endurance, Stress and Anxiety of experimental group due to the effects of Suryanamaskar practice with rhythmic training when compared to the control group.

Keywords: Body mass index (BMI), flexibility, muscular strength and endurance, cardio respiratory endurance, stress and anxiety

Introduction

Yoga is more than mastering postures and increasing your flexibility and strength. In Hinduism, Buddhism and Jainism the word yoga means "spiritual discipline". People often associate yoga with the postures and stances that make up the physical activity of the exercise, but after closer inspection it becomes clear that there are many more aspects of yoga. It is an activity that has been practiced for thousands of years, and it is something that has evolved and changed overtime. (Swami Satyananda Saraswathi 1991). The science of Yoga brings to work on the outermost aspect of the personality, the physical body, which for most people is a practical and familiar starting point. When imbalance is experienced at this level, the organs, muscles and nerves no longer function in harmony, rather they act in opposition to each other. Yoga aims at bringing the different bodily functions in to perfect co-ordination so that they work for the good of the whole body. Walking can help in weight control since it burns at least four times more calories than sitting or standing. (William, E. 1980). Suryanamaskar is an unavoidable part of Yoga. However it is not described in Patangali Yog Sutra, Hathapradipika, Gherandsamita, Yog Vasistha or any main Literature of Yoga. Worshiping Sun as God is there since the Vedic period. However practicing a chain of asana with mantras and pranayama in Suryanamaskar is a recent development- i.e. after 15th - 16th century.

Surya Namaskar, an age-old yogic practice, is a comprehensive exercise, which contributes to mental, emotional, physical, and spiritual well-being. Suryanamaskar helps to increase flexibility, endurance and stamina.

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It tones body muscles and helps to lose weight by activating fat metabolism and normalizing hormonal imbalance. It helps to increase mobility in almost all joints. Blood circulation increases all over the body up to organic level, tissue level and cellular level. Physical health is any bodily activity that enhances or maintains psychological and overall health and wellness. It is performed for various reasons including strengthening muscles and the cardiovascular system, honing athletic skills, weight loss or maintenance, as well as for the purpose of enjoyment. Frequent and regular physical exercise boosts the immune system, and helps prevent the "diseases of affluence" such as heart disease, cardiovascular disease, diabetes and obesity, It also improves mental health and helps prevent depression Physical exercise "exertion of the muscles, limbs and bodily powers, regarded with, reference to its effect on the subject, especially such exertion undertaking with a view to the maintenance or improvement of health" (Mathews 1981).

Rhythmic activities are physical movements combined with a beat or rhythm to it, such as dance or gymnastics, as it enable us to move to the beat of music or musical instruments. Rhythmic activities are combinations of physical movements with sounds, beats, or music. Rhythmic activities rely on an internal or external rhythm used for self-expression, exercise, demonstration of physical ability, socialization, and expression of culture. Hands-free rhythmic percussion exercise garment and method of conducting an exercise program Wiki Matrix The music therapy consisted of choral

singing, voice exercise and rhythmic and free body movements, whereasthe physical therapy consisted of stretching exercises, specific motor tasks and ways to improve balance and gait. Aerobic capacity describes the functional capacity of the cardio respiratory system which includes heart, lungs, and blood vessels. Aerobic capacity is defined as the maximum amount of oxygen the body can use during a specified period, usually during intense exercise. It is a function both of cardio respiratory performance and the maximum ability to remove and utilize oxygen from circulating blood. Generally, light-to-moderate intensity activities that are sufficiently supported by aerobic metabolism can be performed for extended periods of time (Sharon *et al.*, 2007).

Methodology

For the purpose of this study, altogether forty school girls were selected randomly in 12 to 14 years of age from Marudhamalai swamy Devasthanam higher secondary school, Vadavalli, Coimbatore. They were divided into two groups of 20 each. The Experimental group I would underwent suryanamaskar practice with rhythmic training. The second group is Control group. Pre – test and post –test would be conducted. Treatment would be given for twelve weeks. It would be find out finally the effects of suryanamaskar practice with rhythmic training on selected health related physical fitness components and psychological variables among school girls in scientific methods.

Table 1: The selected tests were measured by following units for testing

| Criterion Variables | Test Items | Unit Measurements |
|---------------------------------|-------------------------------------|-------------------|
| Body Mass Index (BMI) | Body Mass Index | kg/m2 |
| Flexibility | Sit and Reach | Centi Meters |
| Muscular Strength and Endurance | Modified Sit – ups | Counts |
| Cardio-Respiratory Endurance | 12 Minutes Cooper’s Run / Walk test | Numbers |
| Stress | Questionnaire | Numbers |
| Anxiety | Questionnaire | Numbers |

Training Programme

Table 2: The following schedule of training was given for the Suryanamaskar practice with rhythmic training group.

| Group | Design of the Training |
|--------------------------|---|
| Experimental Group I | Suryanamaskar Practice with Rhythmic Training |
| Control Group II | Did not do any Specific Training |
| Training Duration | 60 Minutes |
| Training Session | 6 Days a week |
| Total Length of Training | Twelve weeks |

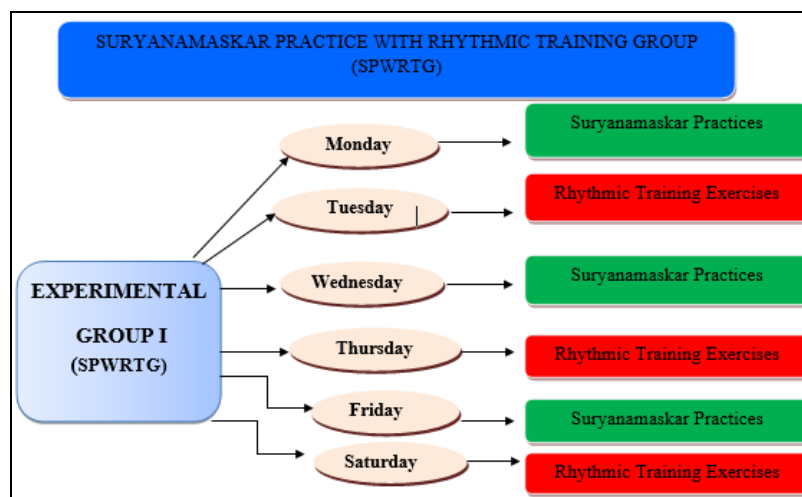


Chart 1: Experimental treatment adopted for experimental group-I

Table 3: Progression of load for experimental Group-I (SPWRTG)

| Week (Monday, Wednesday, Friday) | Training (5+15+30+10 = 60 min) | Duration | Load |
|----------------------------------|--|---|---|
| I to IV | Warming up 1000M Walking / Jogging Suryanamaskar 12 poses practice Warming down | 5 minutes 15 minutes 30 minutes 10 minutes | 3 to 6 rep (4-8 seconds in each poses) |
| V to VIII | Warming up 2000M Walking / Jogging Suryanamaskar 12 poses practice Warming down | 5 minutes 15 minutes 30 minutes 10 minutes | 3 to 6 rep (4-8 seconds in each poses) |
| IX To XII | Warming up 3000M Walking / Jogging Suryanamaskar 12 poses practice Warming down | 5 minutes 15 minutes 30 minutes 10 minutes | 6 to 12 rep (8-12 sec in each poses) |

| Week (Tuesday, Thursday, Saturday) | Training (5+15+30+10 = 60 min) | Duration | Load |
|------------------------------------|--|---|-----------------------|
| I to IV | Warming up 1000M Walking / Jogging Alternate toe touch Jumping Jack Double leg lift Skipping Leg swing forward Aerobic Dance Warming down | 5 minutes 15 minutes 30 minutes 10 minutes | 4 to 8 rep x 2 sets |
| V to VIII | Warming up 2000M Walking / Jogging Alternate leg circle Side ward shuttle run Alternate leg thrust Side skipping Donkey kick Aerobic Dance Warming down | 5 minutes 15 minutes 30 minutes 10 minutes | 8 to 12 rep x 3 sets |
| IX To XII | Warming up 3000M Walking / Jogging Double leg circle Hopping shuttle run Zig-zag run Squat thrust Donkey kick Aerobic Dance Warming down | 5 minutes 15 minutes 30 minutes 10 minutes | 12 to 15 rep x 4 sets |

Experimental Design

The experimental group was given suryanamaskar practice with rhythmic training exercises after taking an initial test. After the initial test selected suryanamaskar practice with rhythmic training exercises were given for twelve weeks in six days. The time of practice was from 6.00AM to 7.00 AM. The control group was not participating in any of the special training programme. However they were allowed to participate in their regular education classes in the school as per their curriculum.

Statistical Technique

The data were statistically evaluated with dependent t-test to

discover obtainable significant development. The level of significance was secure at 0.05 level of confidence for all the cases.

Results and Discussions

The effect of independent variables on each criterion variables was considered by dependent 't' – test on the data achieved for Body Mass Index (BMI), Flexibility, Muscular Strength and Endurance, Cardio Respiratory Endurance, Stress and Anxiety. The pretest and post- test means of experimental group and control group have been analyzed and existing in Table 4 & 5.

Table 4: Mean and dependant 't' – ratio for the pre and post tests on body mass index (BMI), flexibility, muscular strength and endurance, cardio respiratory endurance, stress and anxiety of experimental groups

| S. No | Variables | Pre-test Mean± SD | Post-test Mean± SD | Diff | SE | 't' –ratio |
|-------|---------------------------------|-------------------|--------------------|--------|-------|------------|
| | Body Mass Index (BMI) | 22.91 ± 0.98 | 21.06 ± 0.78 | 0.85 | 0.07 | 8.12* |
| | Flexibility | 8.46 ± 2.47 | 10.33 ± 3.23 | 1.87 | 0.24 | 7.80* |
| | Muscular Strength and Endurance | 14.26 ± 2.57 | 16.73 ± 3.05 | 2.47 | 0.99 | 7.50* |
| | Cardio-Respiratory Endurance | 844.46 ± 28.50 | 1077.33 ± 53.68 | 232.87 | 11.99 | 11.07* |
| | Stress | 28.80 ± 5.83 | 27.00 ± 5.86 | 1.8 | 0.19 | 9.33* |
| | Anxiety | 31.13 ± 3.80 | 29.13 ± 3.99 | 2 | 0.21 | 9.57* |

*Significance at 0.05 level of confidence (2.09).

Table 5: Mean and Dependant 't' – ratio for the pre and post tests on body mass index (BMI), flexibility, muscular strength and endurance, cardio respiratory endurance, stress and anxiety of control group

| S. No | Variables | Pretest Mean±SD | Post test Mean± SD | Diff | SE | 't' –ratio |
|-------|---------------------------------|-----------------|--------------------|--------|-------|------------|
| | Body Mass Index (BMI) | 23.44 ± 1.92 | 23.54 ± 1.26 | 0.10 | 0.13 | 1.71 |
| | Flexibility | 8.53 ± 3.05 | 8.83 ± 2.13 | 0.30 | 0.27 | 1.08 |
| | Muscular Strength and Endurance | 13.20 ± 1.51 | 13.54 ± 1.45 | 0.34 | 0.37 | 1.59 |
| | Cardio-Respiratory Endurance | 728.86 ± 45.55 | 890.26 ± 68.26 | 161.40 | 20.09 | 1.92 |
| | Stress | 28.25 ± 7.06 | 28.00 ± 7.30 | 0.25 | 0.18 | 1.43 |
| | Anxiety | 32.70 ± 3.06 | 32.36 ± 3.76 | 0.33 | 0.39 | 1.08 |

*Significance at 0.05 level of confidence (2.09).

The table 4 and 5, shows that, they obtained 't'-ratio between the pre and post-test means of experimental group were 8.12,7.80,7.50,11.07,9.33,9.57 and control group were 1.71,1.08,1.59,1.92,1.43,1.08 respectively. The table values required for significant difference with df 24 at 0.05 level of confidence. Since the obtained 't' - ratio value of experimental and control group on Body Mass Index (BMI), Flexibility, Muscular Strength and Endurance, Cardio Respiratory Endurance, Stress and Anxiety were greater than

the table value 2.09, it was concluded that the suryanamaskar practice with rhythmic training exercises had significantly improved Body Mass Index (BMI), Flexibility, Muscular Strength and Endurance, Cardio Respiratory Endurance, Stress and Anxiety of experimental group.

The pre and post- test mean value of experimental and control group on Body Mass Index (BMI), Flexibility, Muscular Strength and Endurance, Cardio Respiratory Endurance, Stress and Anxiety were graphically represented in the figure 1.

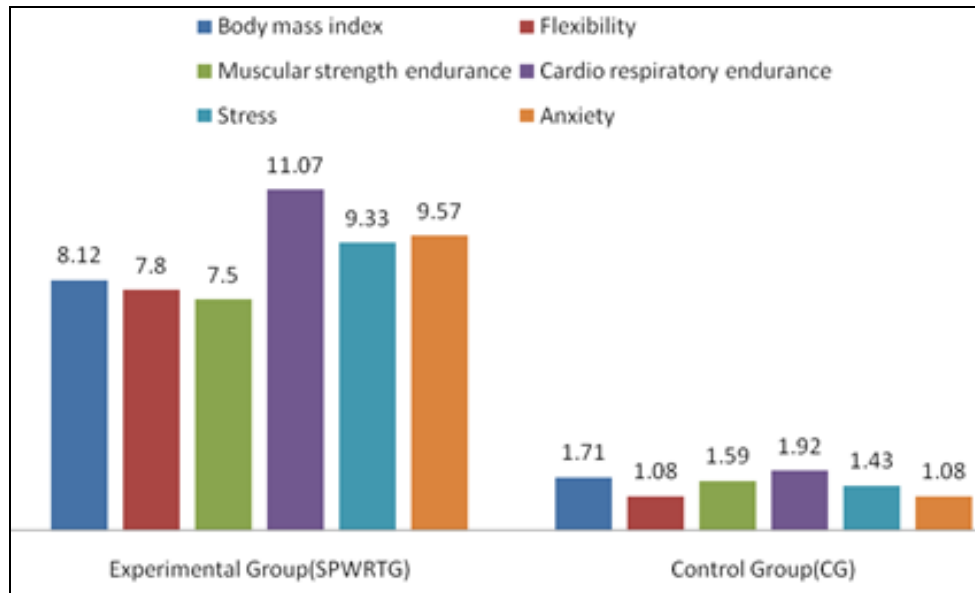


Fig 1: The pre and post- test mean value of experimental and control group on Body Mass Index (BMI), Flexibility, Muscular Strength and Endurance, Cardio Respiratory Endurance, Stress and Anxiety were graphically represented

Discussion on Findings

The finding of the study reveals that the Suryanamaskar practice with rhythmic training group had significant improvement in their health related physical fitness components and psychological variables. In the view of control group there was no significant improvement in their health related physical fitness components and psychological variables. The findings of the study had close relationship with the results of the previous study conducted by E Maude (2011), Kamlesh, M.L, (1988) ^[3], Psychology in Physical Education and Sport.

Conclusions

Improvement on Muscular Strength and Endurance, Cardio Respiratory Endurance, Body Mass Index (BMI), Stress and Anxiety was found significantly on experimental group due to the effects of Suryanamaskar practice with rhythmic training on health related physical fitness components and psychological variables when compared to the control group.

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