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SURYANAMASKAR PRACTICES AND ITS IMPACT ON ANAEROBIC CAPACITY AND FATIGUE INDEX AMONG HANDBALL PLAYERS

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Abstract

In Sanskrit literature surya means sun, and the word namaskar means salutation. The present study was to investigate the suryanamaskar practices and it impact on anaerobic capacity and fatigue index among handball players. For this investigation, the handball players were picked by Regional College of Physical Education, North Tiripura, India using a simple random method. Twenty handball players were randomly allocated to a suryanamaskar practices group and a control group for this study (10 each). For six weeks, the suryanamaskar group did suryanamaskar practices with two dimensions which mean fast and slow suryanamaskar practices for 45-60 minutes each day in the presence of trained yogic trainer and researcher. The control group did not go through any type of specific training. The pre and post controlled randomized design was used for this study. The following selected variables were tested by standardized tools. The pre and post data were collected before and immediately after the training period. The selected variables were anaerobic capacity and fatigue index was tested by standardized tests RAST test method. The collected data were analyzed by using standardized statistical technique. The data was entered into excel spreadsheet, tabulated and subjected to statistical analysis. Various statistical measures are such as Mean, dependent-'t' test and analysis of covariance (ANCOVA). The results were concluded to be statistically considered significant with 0.05 level. The result of the study reveals that suryanamaskar practices had brought out significant positive changes on anaerobic capacity and fatigue index. Regular suryanamaskar practices increases the amount of oxygen delivered to the tissues and removal of carbon dioxide from the body.

Key words: Suryanamaskar, Anaerobic Capacity, Fatigue Index, Handball Players.

Introduction

Suryanamaskar is a sequential combination of yogic postures performed dynamically in synchrony with the breath. It is an integral part of modern yoga training and may be performed either in a slow or rapid manner [1]. Surya namaskar is an ancient method yogic method to worship Sun. In Sanskrit literature surya means sun, and the word namaskar means salutation. Therefore, this practice is known as the Surya namaskar or 'salutation to the sun' [2]. It is an ideal way to relax the mind as it uses the whole body and produces sweating. This can lead to great burn off anger and allow to calmly dealing the situation with full of awareness. It has a deep effect in detoxifying the organs through copious oxygenation and has a deeper relaxing effect. It is a series of 12 physical postures [3]. Surya namaskara

stimulates the peristaltic movement of the gut, which helps to remove excess gas and constipation [4]. While doing these asanas the perspiration cleanses all the pores of the skin resulting in the glowing, clean complexion of the practitioner which is a sign of good skin health. It increases the myocardial contractility and strength [5].

The game of Handball was founded at the end of the 19th century in the northern parts of Europe, specifically in Germany and in Scandinavia. But the modern game of Handball was carved in 1917 in Germany and since then it has gone through several amendments as well. Handball is a team sport in which two teams of seven players each. The purpose of the two teams is to pass and bounce a ball, to throw it into the goal of the opposing team. The team with the most goals after two periods of 30 minute wins [6]. The goal of physiology is to gain in right in to the machinery of the human organism. The roles and interaction of its parts and the resultant output of these interactions, that is, the overall functioning of the organism. Handball is a complete collective sporting modality, characterized by the great amount and variety in its movements, ball manipulations and interaction with other athletes [7].

Anaerobic capacity may be defined as the maximal amount of ATP formed by the anaerobic processes during a single bout of maximal exercise [8]. Fatigue index indicates the rate at which power declines for the athlete. A low value (10) indicates the athlete may need to focus on improving their lactate tolerance [9].

Purpose of the Problem

Keeping the above concept in view, the purpose of the present study was to investigate the suryanamaskar practices and it impact on anaerobic capacity and fatigue index among handball players. Particularly, the study was conducted to investigate if there were any significant differences in selected anaerobic capacity and fatigue index among trained subjects namely the suryanamaskar practices and control groups.

Methodology

Sampling and Subjects

For this investigation, the handball players were picked by Regional College of Physical Education, North Tiripura, India using a simple random method. Twenty handball players were randomly allocated to a suryanamaskar practices group and a control group for this study (10 each). For six weeks, the suryanamaskar group did suryanamaskar practices with two dimensions which mean fast and slow suryanamaskar practices for 45-60 minutes each day in the presence of trained yogic trainer and researcher. The control group did not go through any type of specific training.

Research Design

The pre and post controlled randomized design was used for this study

Statistical Techniques

The pre and post data were collected before and immediately after the training period. The selected variables were anaerobic capacity and fatigue index was tested by standardized tests RAST test method.

The collected data were analyzed by using standardized statistical technique. The data was entered into excel spreadsheet, tabulated and subjected to statistical analysis. Various statistical measures are such as Mean, dependent-'t' test and analysis of covariance

(ANCOVA). The results were concluded to be statistically considered significant with 0.05 level.

Training Programme

During the training period the experimental group namely suryanamaskar practices group underwent their respective training programmes with three alternative days per week for six weeks in addition to their regular activities. Each session lasted one hour. Morning sessions between 7.00 am to 8.00 a.m. were used to perform the training programme. The following training program was given for suryanamaskar practices group at 7.00 am to 8.00 am on three alternative days such as Tuesday, Thursday and Saturday. Each session lasted for 45-60 minutes consisting of 1 minute starting prayer, 5 minutes of sitilikarana vyayama (loosening exercises), 25-35 minutes of suryanamskar followed by preparatory pranayama for 10 minutes after that the relaxation technique was given for 5 minutes and ending prayer was given at the end of the session for 1 minute respectively.

Result and Findings

The influence of impact of suryanamaskar practices on anaerobic capacity and fatigue index among handball players were analyzed and presented below.

Table-1

Computation of 'T' - Ratio between Pre and Post-Test Means of Experimental and Control Groups on Anaerobic Capacity and Fatigue Index

Criterion Variables	Test	Experimental Group	Control Group
Anaerobic Capacity	Pre test	552.17	564.75
	Post test	667.89	570.88
	't'-test	8.76*	1.03
Fatigue Index	Pre test	10.65	10.59
	Post test	16.44	11.01
	't'-test	12.37*	1.22

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

The table-I shows that the pre-test mean value on anaerobic capacity and fatigue index among experimental and control groups were 552.17 & 564.75 and 10.65 & 10.59 and the post-test means are 667.89 & 570.88 and 16.44 & 11.01 respectively. The obtained dependent t-ratio values between the pre and post-test means of experimental and control groups are 8.76 & 1.03 and 12.37 & 1.22 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 anaerobic capacity and fatigue index. However, the control group has 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 Anaerobic Capacity and Fatigue Index of Experimental & Control Groups

Test	Experimental Group	Control Group	SOV	SS	Df	MS	F-ratio
Adjusted Post-Test Mean							
Anaerobic Capacity	674.48	571.14	**B.M**	464.20	1	464.20	**31.97***
			W.G	264.84	17	14.52	
Fatigue Index	16.12	11.14	**B.M**	106.88	1	106.88	**21.08***
			W.G	86.19	17	5.07	

** 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 on anaerobic capacity and fatigue index. The obtained f- ratio for variables was 31.97 and 21.08 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 anaerobic capacity and fatigue index.

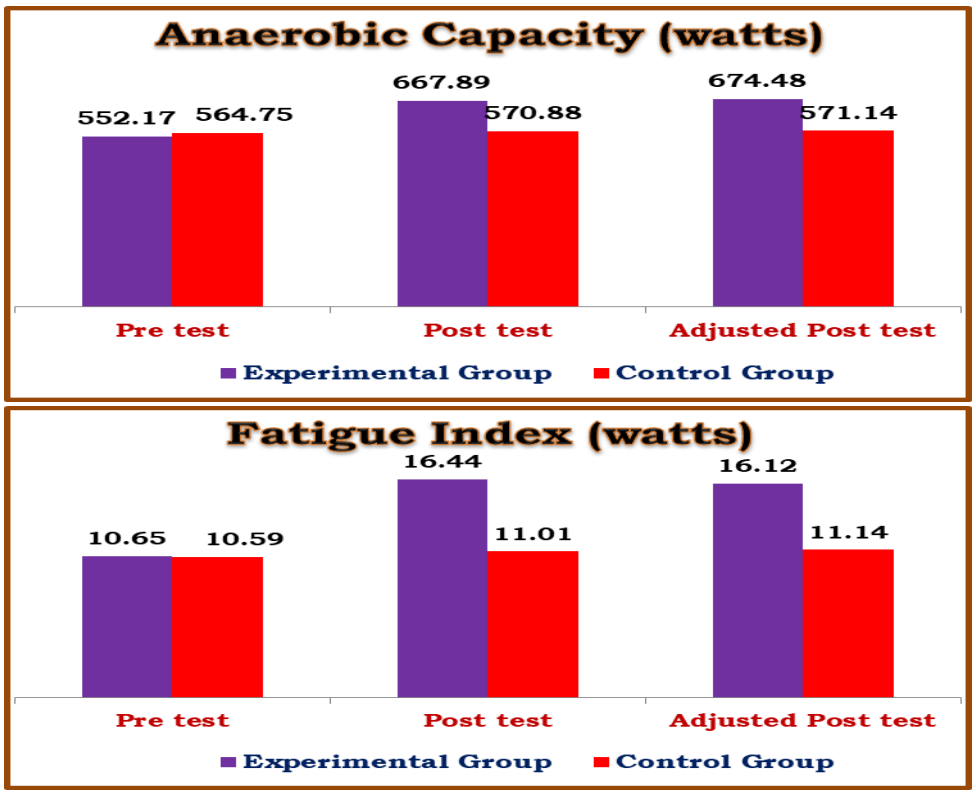

Figure I: pre, post and adjusted post-test mean value of experimental and control groups on anaerobic capacity and fatigue index.

Discussion on Findings

The result of the study reveals that suryanamaskar practices had brought out significant positive changes on anaerobic capacity and fatigue index. Regular suryanamaskar 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. The below findings are in

accordance with observations made by the following renowned experts were Bhavanani, (2013) evaluated the immediate effects of SuryaNamaskar on reaction time and heart rate in female volunteers [10]. Anuja, & Arumugam, (2020) analysed the effect of yoga asana with pranayama practices on high and low density lipoprotein among women type-2 diabetes patients [11]. Selvakumar & Vigneshwaran, (2019) evaluated the influence of pranayama practices on resting pulse rate among kabaddi players [12]. Vigneshwaran, (2015) conducted the influence of pranayama practices on breath holding time among hockey players [13]. Suriya & Arumugam, conducted a study on influence of varied breathing exercises on vital capacity and breath holding time among kabaddi players [14]. Murugan & Arumugam studied on influence of short-term yogic practices on vital capacity among medical college students [16]. Suriya & Arumugam, conducted a study on effect of strength-based training on anaerobic power and fatigue index among soccer players [17].

CONCLUSIONS

From the result of the present study the following conclusions were drawn,

1. There were significant positive changes occur on anaerobic capacity due to the impact of suryanamaskar practices among intercollegiate handball players.
2. There were significant positive changes occur on fatigue index due to the impact of suryanamaskar practices among intercollegiate handball players.
3. There was significant difference existed between experimental and control groups on anaerobic capacity and fatigue index due to the impact of suryanamaskar practices among intercollegiate handball players.
4. However, the control group had not shown any significant improvement on any of the selected variables.

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