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Effect of Suryanamaskar on Joint Flexibility

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Abstract
The purpose of the study was to find out the effect of Suryanamaskar on joint flexibility among school volleyball players. To achieve the purpose of the study, thirty school volleyball players (n=30) from Daniel Thomas Matriculation Higher Secondary School, Tisiayanvilai were selected as subjects at random. The age category of the subject was under 19. All the subjects were divided into two groups with 15 subjects each as experimental and control group. Group I underwent Suryanamaskar practices for a period of six weeks of five days per week and group II acted as control who did not participate in any special training other than the regular routine.. Ankle and wrist flexibility was selected as dependent variables and it was measured by using flexomeasure. It was concluded that, there was a significant improvement takes place on ankle and wrist flexibility and also there was a significant difference exists between experimental and control groups on ankle and wrist flexibility.

Keywords: Suryanamaskar, Joint Flexibility, volleyball

1. Introduction
Surya Namaskar or Sun Salutation is a common sequence of Hatha yoga asanas. This sequence of movements and poses can be practised on varying levels of awareness, ranging from that of physical exercise in various styles, to a complete sadhan, which incorporates asana, pranayama, mantra and chakra meditation. The physical base of the practice links together twelve asanas in a dynamically performed series. These asanas are ordered so that they alternately stretch the spine backwards and forwards (O'Malley, 2011) [4].

A full round of Surya Namaskar is considered to be two sets of the twelve poses with a change in the second set to moving the opposite leg first through the series. Proponents of the use of Surya Namaskar as part of the modern yoga tradition prefer to perform it at sunrise, which the orthodox consider to be the most 'spiritually favourable' time of the day. Surya Namaskar provides all of the key health benefits of yoga in a very succinct package. It is a holistic exercise that provides physical health benefits, but also mental or emotional as well as spiritual benefits.

The obvious advantage of Surya Namaskar is the workout it provides for the muscles, but it also benefits joints, ligaments and the skeletal system by improving posture, flexibility and balance. In addition to these physical benefits, Surya Namaskar practice stimulates and conditions virtually every system in the body. It is good for the heart and stimulates the cardiovascular system. It oxygenates the blood and helps strengthen the heart. Surya Namaskar is good for the digestive system and the nervous system. It stimulates the lymphatic system and supports respiratory system health, as well (Nattu & Agarwal, 2004) [3].

2. Statement of the Problem
The purpose of the study was to find out the effect of Suryanamaskar on joint flexibility among school Volleyball players.

3. Methodology
To achieve the purpose of the study, thirty school volleyball players (n=30) from Daniel Thomas Matriculation Higher Secondary School, Tisaiyanvilai were selected as subjects at random. The age category of the subject was under 19. All the subjects were divided in to two groups with 15 subjects each as experimental and control group. Group I underwent Suryanamaskar practices for a period of six weeks of five days per week and group II acted as control who did not participate in any special training other than the regular routine. Ankle and wrist flexibility was selected as dependent variables and it was measured by using flexomeasure.

4. Analysis of Data
The analysis of dependent 't' test on the data obtained for ankle and wrist flexibility of the pre-test and post-test means of experimental and control groups have been analysed and presented in Table I & II.

Mean values of experimental and control group on ankle and wrist flexibility was shown in figure I & II.

Table 1: The Summary of Mean and Dependent 'T' Test For the Pre and Post Tests on Ankle and Wrist Flexibility of Experimental and Control Groups

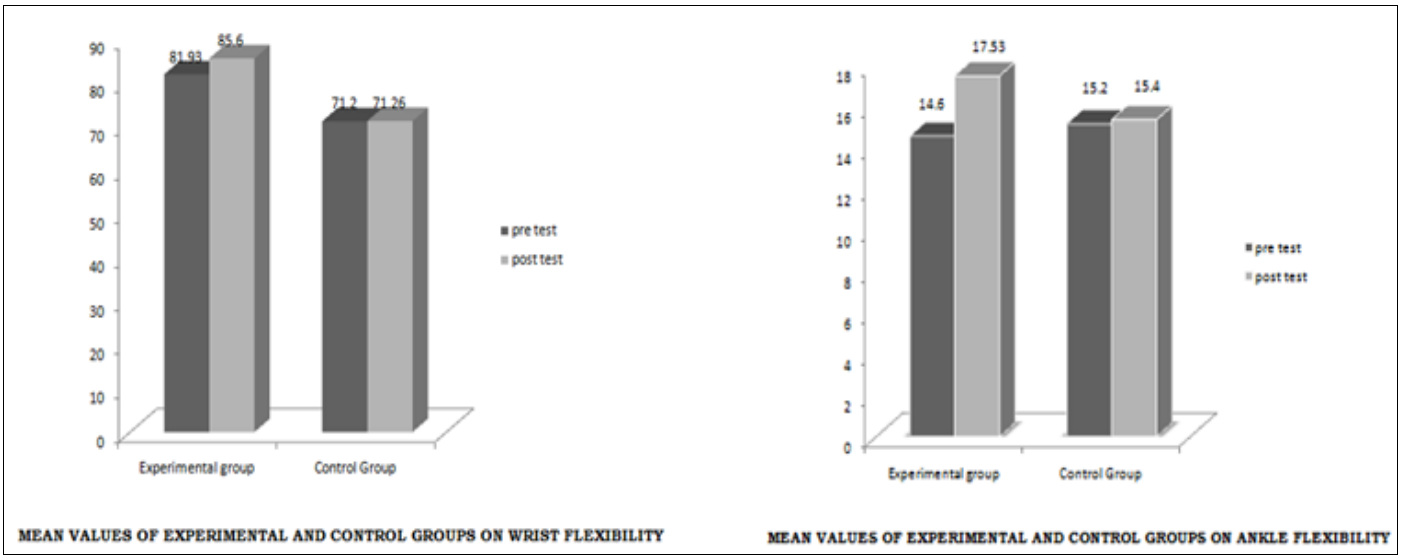
Variables	Mean	Experimental Group	Control Group
Ankle Flexibility	Pre test mean	14.60	15.20
	Post test Mean	17.53	15.40
	't' test	14.22*	1.38
Wrist Flexibility	Pre test Mean	81.93	71.20
	Post test Mean	85.60	71.26
	't' test	5.27*	.09

*****Significant at .05 level. (The table value required for .05 level of significance with df 14 is 2.145)

Table 2: Analysis of Covariance on Ankle and Wrist Flexibility of Experimental and Control Groups

Variables	Adjusted Post Test Mean Values		Sources of Variance	Sum of Square	df	Mean Squares	F-ratio
	Experimental Group	Control Group					
Ankle Flexibility	17.82	15.11	Between	54.53	1	54.53	115.13*
			Within	12.78	27	.47	
Wrist Flexibility	80.21	76.64	Between	34.88	1	34.88	4.61*
			Within	204.26	27	7.56	

*Significant at .05 level of confidence. (The table value required for significance at .05 level with df 1 and 27 is 4.21)



MEAN VALUES OF EXPERIMENTAL AND CONTROL GROUPS ON WRIST FLEXIBILITY

MEAN VALUES OF EXPERIMENTAL AND CONTROL GROUPS ON ANKLE FLEXIBILITY

5. Results and Discussion

The result of study indicated that experimental group had significantly improved the performance of ankle and wrist flexibility when compared to control group.

It also indicated that there was significant difference exists between the adjusted post test means of experimental and control group on ankle and wrist flexibility. The result of this study is reported by many of the research findings.

It was speculated that Suryanamaskar can be an ideal aerobic exercise as it involves both static stretching and slow dynamic component of exercise with optimal stress on the joints (Sasi KA, Sivapriya DV, Shyamala T, 2011) [5].

O'Malley, G (2011) [4] assessed the flexibility of four rounds of Suryanamaskar, a typical amount performed by practitioners, to determine its potential as a training and weight loss tool.

Mody, B. S, (2011) [2] confirmed that yoga in general has a significant impact on flexibility and specifically that dynamic suryanamaskar also supports in this effect all other yogic asanas and practices.

Bhavanani AB, Udupa K, Madanmohan, Ravindra P, (2011) [1] reported a significant increase in flexibility for the hip, hip and trunk, and neck for the yoga group was also reported. The significant effect of various Hatha yogic practices on flexibility was also reported.

Natu MV, Agarwal AK, (2004) [3] determined the post hoc least significant difference test in relation to flexibility shows that the duration of the six weeks of the treatment was sufficient to bring about significant difference (Mean Difference =-6.025) in flexibility. The study also shows that the effect of dynamic Suryanamaskar remains for two weeks even after a pause in treatment but the achieved performance decreases significantly after four weeks of rest.

It is inferred from the above literature cited and the result of the present study, it's concluded that Suryanamaskar is the best practice to improve the flexibility at the joints.

6. Conclusion

On the basis of the interpretation of the data, the following conclusions may be drawn.

1. There was a significant improvement takes place on ankle and wrist flexibility
2. There was a significant difference exists between experimental and control groups on ankle and wrist flexibility

7. References

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