

## **EFFECTS OF YOGIC PRACTICE AND MOBILITY TRAINING ON MUSCULAR STRENGTH ENDURANCE OF INTER COLLEGIATE HANDBALL PLAYERS**

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### **ABSTRACT**

The purpose of the study was to find out the effects of yogic practice and mobility training on muscular strength endurance of inter-collegiate handball players. To achieve the purpose of the study, forty five inter collegiate handball players were selected from Rani Chennamma University, Belagavi, Karnataka. The subject's age ranged between 19-25 years. The selected subjects were divided into three equal groups of fifteen each. Group – I (n = 15) underwent Yoga practice, group – II (n = 15) underwent Mobility training, group – III (n = 15) acted as control. The collected data from the three groups prior to and post experimentation on muscular strength endurance were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved, whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. The result of the study revealed that twelve weeks of yoga practice and mobility training had an impact to increase muscular strength endurance of handball players.

**Key words:** yogic practice, mobility training and muscular strength endurance.

## INTRODUCTION

Yoga is the physical, mental, and spiritual practices or disciplines that aim at transforming body and mind. The term denotes a variety of schools, practices and goals in Hinduism, Buddhism and Jainism the best known being Hatha yoga and Raja yoga. The term yoga is derived from the literal meaning of "yoking together" a span of horses or oxes, but came to be applied to the "yoking" of mind and body.

Mobility is the ability to move a limb through its full range of motion. This is not to be confused with flexibility which is simply the length of the muscle. Mobility is a controlled voluntary movement through its entire functional range of motion. Mobility training is the process in which we work to improve mobility in all or a single joint. Flexibility is an important component of health-related fitness, but flexibility training is often neglected, even among regular exercisers. Flexibility describes the ability of joint and surrounding muscles to move through a specific range of motion with ease and without pain. It leads to improved efficiency in completing activities of daily living such as bending, reaching, squatting and stepping over things and gives better posture and reduces risk of injury. There is some evidence that pre-exercise stretching may increase athletes' range of movement (Behm, *et al.*, 2016).

## METHODOLOGY

### Subjects and Variables

The purpose of the study was to find out the effects of yogic practice and mobility training on muscular strength endurance of inter-collegiate handball players. To achieve the purpose of the study, forty five inter collegiate handball players were selected from Rani Chennamma University, Belagavi, Karnataka. The subject's age ranged between 19-25 years. The selected subjects were divided into three equal groups of fifteen each. Group – I (n = 15)

underwent Yoga practice, group – II (n = 15) underwent Mobility training, group – III (n = 15) acted as control. The muscular strength endurance was measured by pull-ups test.

### **Training Protocol**

Group I underwent yoga practice for three days per week for twelve weeks with 2-4 sets: 3-6 repetitions, and group II underwent mobility training for three days per week for twelve weeks with 1-3 sets: 4-10 repetitions along with 2 min rest. In every day training session, the work out lasted approximately between 45 minutes and an hour, which included warming up and limbering down.

### **Experimental Design and Statistical Technique**

The experimental design in this study was random group design involving 45 subjects. The collected data from the three groups prior to and post experimentation on muscular strength endurance were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved, whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any.

### **Results**

The data collected before and after the experimental period on muscular strength endurance of experimental and control group were analysed and presented in table – I

**Table - I**

**Analysis of Covariance on Muscular Strength Endurance of Yoga Practice Mobility  
Training and Control Groups**

	Yoga Group	Mobility Group	Control Group	S O V	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean	6.66	7.10	6.53	B	1.73	2	0.86	0.54
SD	1.23	1.46	1.06	W	67.06	42	1.59	
Post test Mean	10.26	11.73	6.80	B	192.53	2	96.26	35.38*
SD	1.90	1.75	1.20	W	114.26	42	2.72	
Adjusted Post test Mean	10.33	11.45	7.06	B	157.87	2	78.93	74.54*
				W	43.41	41	1.05	

*\*Significant at .05 level of confidence (The required table value for significance at 0.05 level of confidence with degree of freedom 2 and 42 is 3.22 and degrees of freedom 2 and 41 is 3.23)*

Table – I shows that the pre test means and standard deviation (SD) on muscular strength endurance of yoga practice, mobility training and control groups are  $6.66 \pm 1.23$ ,  $7.10 \pm 1.46$  and  $6.53 \pm 1.06$  in that order. The attained 'F' ratio assessment of 0.54 was not as much of the essential table score of 3.22 for the quantity of freedom 2 and 42 at 0.05 level of pledge, which shows that the informal mission of the subjects were a success because the pre check scores on muscular strength endurance among groups didn't vary drastically.

The post take means and SD on muscular strength endurance of yoga practice, mobility training and control groups are  $10.26 \pm 1.90$ ,  $11.73 \pm 1.75$  and  $6.80 \pm 1.20$  in that order. The attained 'F' ratio assessment of 35.38 on muscular strength endurance was as much of the essential table score of 3.22 for the quantity of freedom 2 and 42 at 0.05 level of

pledge. It implies that important variation existed between the groups on the post test phase on muscular strength endurance.

The adjusted post-test means on muscular strength endurance of yoga practice, mobility training and control groups are 10.33, 11.45 and 7.06 respectively. The attained 'F' ratio assessment is 74.54 of muscular strength endurance was as much of the essential table score of 3.23 for the quantity of freedom 2 and 41 at 0.05 level of assurance. The outcome of the study tells that, major differences be presented among experimental and control groups on muscular strength endurance. Since, the adjusted post test mean 'F' value was found to be considerable, the data on muscular strength endurance is subjected to post hoc analysis using Scheffe'S test and the results are offered in table-II.

**Table – II**  
**Scheffe'S Test for the Differences between the Adjusted**  
**Post Test Paired Means on Muscular Strength Endurance**

Adjusted Post Test Mean			Mean Differences	Confidence Interval
Yoga Practice	Mobility Training	Control Group		
10.33	11.45		1.12*	0.95
10.33		7.06	3.27*	0.95
	11.45	7.06	4.39*	0.95

*\*Significant at .05 level.*

Table-II shows that the adjusted post test mean differences on muscular strength endurance between yoga practice and mobility training groups; yoga practice and control groups; mobility training and control groups. The result indicates that there were significant difference among the experimental and control groups on muscular strength endurance of the inter-college handball players. Hence, mobility training had better stimulation to increase on muscular strength endurance of inter-college handball players.

**Figure – I****PYRAMID DIAGRAM ON MUSCULAR STRENGTH ENDURANCE OF EXPERIMENTAL AND CONTROL GROUPS****Discussion on Findings**

The result of the study inform that twelve weeks of yoga practice, mobility training induced to increase on muscular strength endurance of the inter-college level men handball players when compared to the control group hand ball players. Hence, mobility training had better stimulation to increase on muscular strength endurance of inter-college handball players. The following studies are strengthening the present results. Karthick *et al.*, (2016) investigated effects of SAQ training on selected physical fitness parameters and kicking ability of High School Level male Football Players. They concluded that due to the influence of effects of SAQ training significantly improved selected physical fitness parameters and kicking ability of High School Level male Football Players. Arjunan (2015) found out the effect of speed, agility and quickness (SAQ) training on selected physical fitness variables among school soccer players. The result of the study stated that SAQ training has significantly contributed to improve muscular strength and endurance of soccer players. Mohamed (2015) investigated the efficacy of (speed, agility, and quickness; SAQ) method on jump shot and physical performance variables for youth handball players. They suggested that youth athletes can benefit by reinforcing muscles and improving the speed, agility, flexibility and jump shoot performance through SAQ exercises. Kuppan and Muthuraj (2019) investigated the effect of resistance, aerobic and concurrent training on muscular

strength of untrained college students. The result of the study proved that the effect of resistance, aerobic and concurrent training significantly improved muscular strength of the untrained college men students.

## Conclusions

The conclusion of the study inform that twelve weeks of yoga practice, mobility training induced to increase on muscular strength endurance of the inter-college level men handball players when compared to the control group hand ball players.

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